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Drilling and Boring Machine.

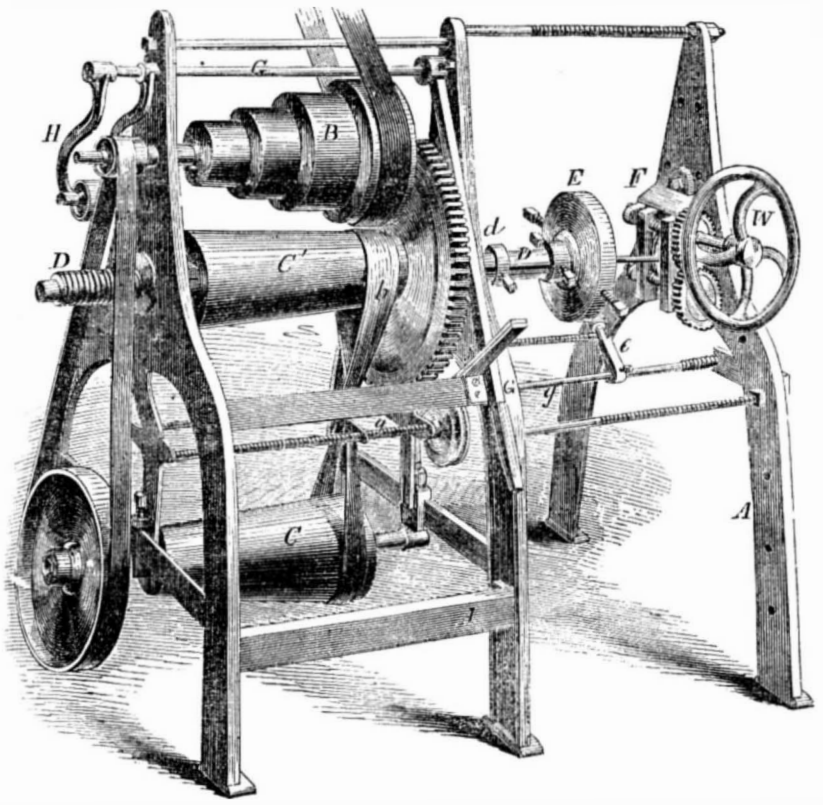
The annexed figure is a perspective view of the Universal Machine for Drilling, Screw Cutting, and Boring, for which a patent was granted to Joel P. Heacock, of Marlboro', Stark Co., Ohio, on the 27th ult., the claim of which was published in the last number of the SCIENTIFIC AMERICAN.

A A represents the framing; B are the pulleys on the driving shaft; C' is a cone pulley, with an opening through the entire length of its center, through which passes the mandrel shaft, D; this shaft has a screw cut on part of its length, and works in the thread of a nut in the interior of pulley, C'; this pulley may be said to be the nut of the mandrel screw shaft, which is moved backward and forward, advancing in boring, drilling, &c., and then running it back without changing the direction of its motion. This is done as follows:—In the shaft, D, near the chuck, E, there is a groove; in this, behind ring *d*, is a feather (not seen) which keys said shaft with the large cog wheel. This cog wheel receives motion from the driving shaft by a pinion (not seen,) and thus it moves the mandrel, but gives it the backing motion. The forward feed of the mandrel is obtained by the lower cone pulley, C, which drives the upper cone pulley, C', by the belt, *b*. The lower cone pulley is driven by a belt, I, passing over a small pulley on the outer end of the driving shaft, and over a large pulley on the outer end of the lower cone shaft. As the belt, *b*, passes over the larger end of the lower cone pulley, and the narrow end of the upper one, C', the latter receives a more rapid motion than the shaft, D, by the direct driving of the cog gear, consequently as its interior has a thread upon it, the screw shaft, D, of the mandrel must feed forward for drilling or boring, &c. To feed back the screw mandrel, the motion of the lower pulley, C, has only to be arrested, when the pulley, C', acts as a stationary nut, and by shaft D still revolving in the same direction, it feeds itself backwards.

The belt, I, is hung quite slack, and is rendered tight to drive the lower pulley by a tightening or hanging pulley, H, which is secured to the outer end of an oscillating shaft, G. To the inner end of this shaft (forming a continuous connection) there is attached a lever, G, which hangs down, as shown, when thrown out of action. By elevating the lower end of this lever, the tightening pulley, H, will be forced against the belt, I, thus making it taut and giving it motion, thereby driving the lower cone pulley, C, which gives motion to the upper cone, C', by the belt, *b*, and feeds the mandrel forward. By throwing down the lever, G, the tightening pulley, H, is pushed back from belt, I, and the motion of the lower cone, C, is stopped, also that of the upper cone, C', and the mandrel shaft, D, then feeds back by the pinion on the main shaft driving the cog wheel on the mandrel, D.

On the forward part of the frame there are vibrating shipping devices, to make the mandrel move backwards, after the tool has done its work. *g* is an arm or rod inserted in seats in the uprights, and connected with the catch or lock arm, *f*, On the front rod, *g*, is a small dog or trigger, *e*, which projects upwards and

DRILLING AND SCREW CUTTING MACHINE.

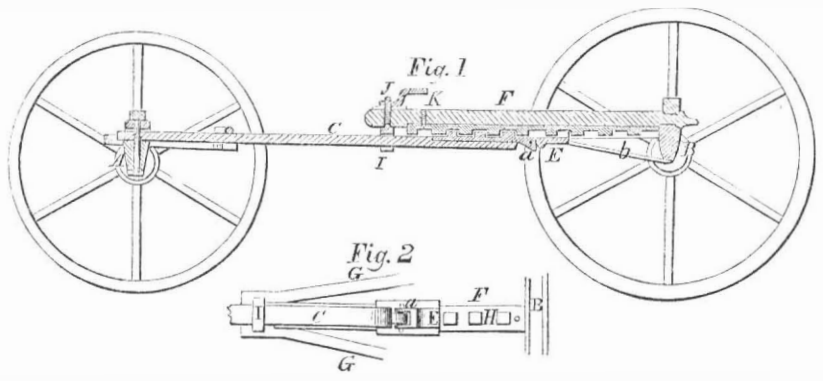


inwards so as to be pressed forwards by the chuck, E, when the latter has advanced to the required distance. The edge of the arm, *f*, has notches in it, and the lever, G, when raised, is set in one of these, and held there when the mandrel is set to feed forward. The tightening pulley, H, now gives motion to the lower cone pulley, C, and the mandrel, D, feeds forward, boring with a drill, cutting a thread with a tap in a nut, or on a bolt with a die. When the chuck, E, holding the tool, has advanced to the proper distance, it presses against the trigger. *e*, which tilts the clutch arm, *f*, and the end of lever G drops down, the tightening pulley, H, is then thrown out, and the motion of the lower pulley, C, ceases. As has been explained, the mandrel, still rotating in the same direction, feeds back of itself. The trigger, *e*, is set at any point, so as to reverse the mandrel for any desired length of feed. The belt, *b*, holds the cone pulley, C', firm, while the mandrel bar is feeding back. This belt can be set on the pulleys at any point, to give the mandrel more or less motion as it is moved from the center towards the end, thus giving the desired grade of feed. The ring, *d*, on the mandrel in the front, has a pointed screw pin, which projects into the slit or groove in the mandrel.—As the mandrel is fed back the pin presses against the feather in the groove which keys the cog wheel to the mandrel, forcing it against the shoulder of the cone pulley, C', thus acting like a friction coupling, and gives motion to the upper cone pulley, and as its motion then becomes equal to that of the screw of the mandrel the latter ceases to feed backward. The ring, *d*, therefore regulates the back feed of the mandrel and the trigger, *e*, the forward feed, so as to feed the mandrel bar the required distance to execute any work the machine has to perform. These devices, and the way they are arranged and operate, exhibit a great deal of ingenuity.

F is the box or jaws for supporting the articles to be operated upon. It has two jaws, one on each side, through which pass two screws—each having a right and left hand screw cut in it. By turning the wheel, W, both of these jaws will advance together—parallel—and center and grip the article to be acted upon. A tap is now shown in the figure in the act of cutting a thread in a nut in the jaws of F. The lever, G, is shown as being just thrown out of catch with the arm, *f*, and the mandrel is beginning to back, after having completed its work. By turning the wheel, W, to the left, the jaws open and the nut may be taken out and another inserted. This machine is capable of doing all kinds of boring, from the smallest boxing to the largest steam engine cylinders, fly wheels, car wheels, &c. Also drilling and screw cutting, which is performed without change or alteration of machinery, tools only excepted.

By letter addressed to Mr. Heacock, at his residence given above, more information about patent rights and the manufacture of these useful machines may be obtained.

PATENT CARRIAGE REACH.



On the 16th of October last a patent was granted to Edwin Wilson, of Prattsburgh, N. Y., for the extension Carriage Reach illustrated by fig. 1, a vertical longitudinal section, and fig. 2 an inverted plan view of the accompanying engravings.

In fig. 1, A represents the front axle of a vehicle, and B the back axle. C is the reach, the front end of which is attached to the front axle in the usual manner. The back part of the reach has a cog bar attached to its upper surface, said bar having a slide, E, fig. 2, connected to its outer end by a hinge or joint, *a*. F represents the center piece of the hounds, G, which are attached to the back axle, B.—These hounds are constructed in the usual way; the back ends of the hounds, G, are fitted upon the upper edge of the back axle, and braces, *b*, are secured to the underside of the axle and to the under side of the hounds. The under side of the center piece, F, has a cogged bar attached to it. The sides of the cogged bar extend a short distance beyond each side of the cogs, as shown in fig. 2, and the slide, E, has recesses in its inner sides, in which recesses the sides or edges of the cogged bar, H, fit. I is a clasp, which has a screw rod, J, attached to its upper end, said screw rod passes through the end of the center piece, F, of the hounds, and has a nut, K, upon it above the center piece. The reach, C, passes through the clasp, I, and the cogs on one bar fit between the cogs on the other, the clasp, I, and slide, E, keeping the cogs geared or fitted into each other. By this arrangement it will be seen that the reach, C, cannot move horizontally from the center piece, F, of the hounds, in consequence of the cogged bars, and the cogs cannot become loosened or ungeared from each other in consequence of the clasp, I, and slide, E. In case the reach requires to be either extended or shortened, the center piece, F, is raised by unscrewing the nut, K, and the cogged bars are then ungeared, and the slide, E, may be moved outward or inward, on the center piece, F, to the desired point, and the clasp, I, again screwed up to the center piece, F. The joint, *a*, in the slide, E, allows the center piece, F, of the hounds to raise. This improvement is extremely simple, and the reach may be extended or shortened in a moment of time, and with the greatest facility. The reach also is strong, much more so than the ordinary one which are weakened by bolt holes made through it in order to render it capable of being extended. The back axle also is kept in proper position, and is not allowed to turn or cant inwards, as is the case with the ordinary reach, in consequence of the sagging or depression of the reach at its center, or where it is connected to the center piece of the hounds.

By letter addressed to J. R. Selover, Prattsburgh, Steuben Co., N. Y., more information respecting the sale of patent rights, &c., may be obtained.

Railway Telegraphs.

We believe there is only one railroad in the country which habitually and constantly employs the telegraph, and that is the New York and Erie, which, at its own expense has erected wires along its entire line. The expense of putting up this telegraph was some $50,000, and the cost of operating it is about $30,000 a year; yet the Superintendent, Mr. McCallum, states that the value of the services rendered by it is more than $100,000 a year. By its means each Division Superintendent maintains a constant control over all the trains in his division, and it frequently happens that every train is running under special orders transmitted by the telegraph. Indeed, whenever any train is more than ten minutes out of time, the fact and cause of the delay are at once reported to the General Superintendent for his action. Thus every employee on the road is held to constant accountability for any delay occasioned by his fault.

Every railroad in our country should have its own telegraph.

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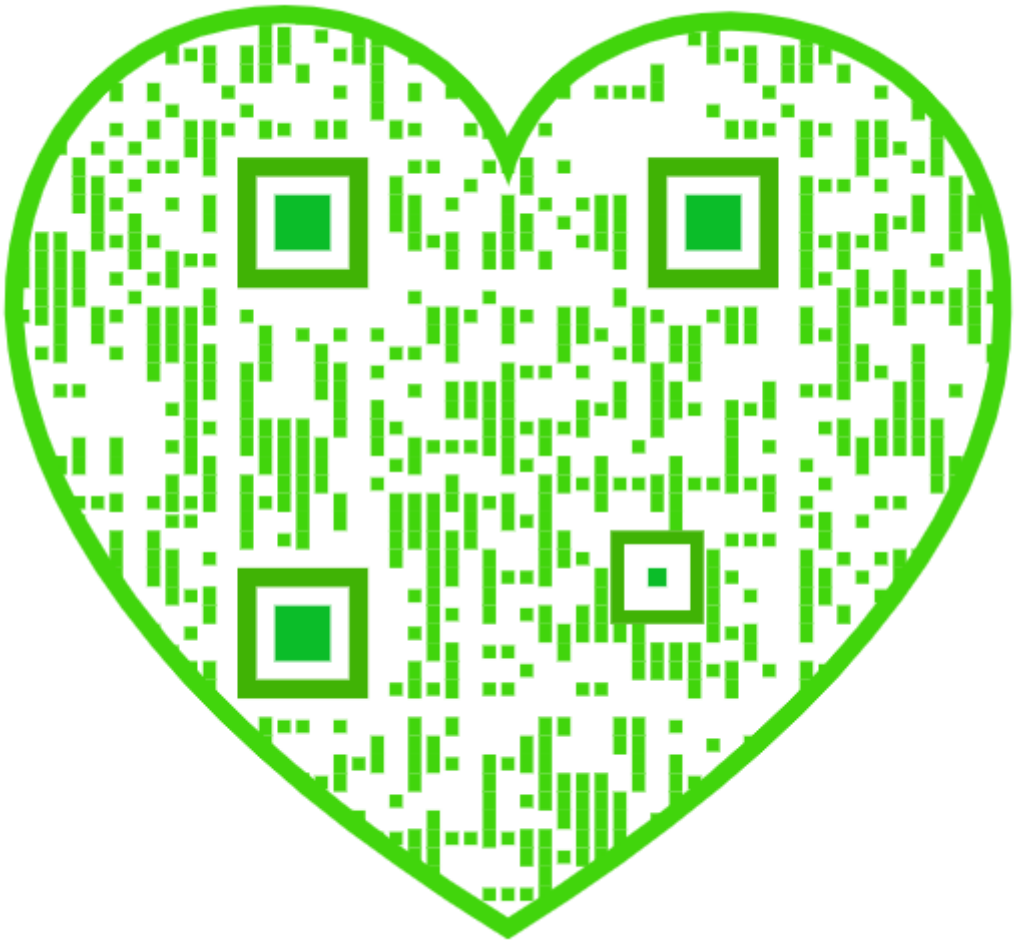

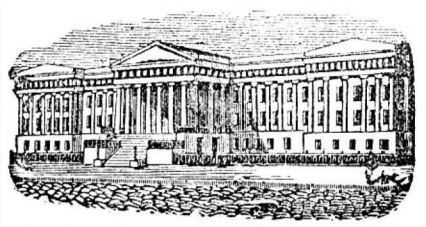

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DEC. 4, 1855.

SUSPENDING SHIPS' YARDS—Thos. Batty, of Brooklyn, N. Y.: I claim the arrangement of the yard, the beam, i, and the crane, e e', substantially as and for the purposes set forth.

[The foregoing is part of an improvement for which one patent has already been secured by Mr. Batty. Two grants were required in order to cover the entire invention. The improvement consists in a peculiar method of attaching standing topsail yards to the mast, whereby the mast is relieved from strain by the weight, while the yards at the same time, can be conveniently moved and swung about. This invention is more particularly useful on vessels where Forbes', Howe's, and other new rigs are employed.]

CUTTING PILE FABRICS—E. B. Bigelow, of Boston, Mass.: I claim the employment of a rotating cutter, in combination with take-up rollers, substantially in the manner and for the purpose specified.

HANGING WINDOW SASHES—E. W. Bullard, of Hardwick, Mass.: I claim the improved mode described, of hanging and fastening sashes, which consists in beveling one side of the sashes, and combining therewith a corresponding wedge or beveled strip, moved up and down, as described, or in any other way, by which arrangement the modes set forth of fastening, loosening, and removing the sashes from the frame are secured.

MILITARY SADDLES—Daniel Campbell, of Washington, D. C.: I claim, first, placing the arch of the connecting strap of the holsters below the pommel of the saddle, and supporting the holsters upon projections from the forward ends of the side bars of the saddle-tree, or their equivalent, substantially as set forth.

Second, I also claim covering the holsters by means of the roof piece, B, attached to the connecting strap of the holsters, and the covers, C C, which are pivoted to the sides of the holsters, substantially as set forth.

I also claim constructing the valise of two connected receptacles, D D, which are supported immediately in the rear of the legs of the cantel, substantially in the manner and for the purpose set forth.

MAKING PLOW MOLD BOARDS—Thos. A. Chandler, of Rockford, Ill.: I claim the forming eccentric roller, B, clamp plate, D, with the cam lever, G, and the press plate, F, when constructed, arranged, and operated substantially in the manner and for the purpose set forth.

SAWING OUT AND TAPERING BLOCKS OF MARBLE—J. A. Cole, of Washington, D. C.: I claim attaching the saws to swinging frames, f f, by pivots at each end, which will admit the shoes, b b, turning to any angle to follow guides, e e, the whole being arranged in the manner and for the purpose set forth.

CHAMFERING THE EDGES OF SHOE SOLES, &c.—O. R. Dinsmoor & L. J. Bartlett, of Salisbury, N. H.: We claim the combination and arrangement of the lever gauge and spring presser with the knife blade or chisel, substantially as specified, the same being used in manner and for the purpose essentially as explained.

FLUES AND DAMPERS IN COOKING APPARATUS—J. A. Elder, of Westbrook, Me., and Wm. J. Thorn, of Hollister, Mass. We claim the arrangement of the dampers, 4, 5, 10, 13, and 8 S, in combination with the oven flues, 14, 15, and 16, in the manner substantially as described, for regulating and controlling the heat, for the purposes specified.

RAILROAD CAR COUPLING—J. T. England, of Baltimore, Md.: I claim the described coupling, consisting of a ball, so arranged in the buffer head as to support, at its lowest position, the pin, and to be pushed away and allow the pin to fall on the introduction of the link, as set forth.

WOOL COMBING MACHINES—Peter Fairbairn, of Leeds, and John Hargrave, of Kirkstall, Eng. Patented in England, Nov. 6, 1852: We do not confine ourselves to the precise arrangement of machinery, as described.

But we claim, in machinery for opening, combing, and drawing wool, flax, and other fibrous materials, combining one and the same machine, two or more rotary gill cylinders, fitted with advancing and receding gills, and rotating at different speeds, for the purposes set forth.

CUTTING OUT BOOT AND SHOE SOLES—J. W. Hatch, of Rochester, N. Y.: I claim, first, the, projections, d d', at different distances on the face of the wheel, and the fork, e e, on the sector lever, E', having its prongs at different elevations, combined and operating, substantially as set forth.

Second, the application of the spring friction bar, h, to the yoke, I, for preventing the return of the sector lever, before the proper time, in the manner specified.

[The above invention is an improvement on a machine, for the same purpose, patented a few months since, by Messrs. Hatch & Churchill. The cutting is done by means of hollow punches, which have the shape of the sole or other article to be produced.

The object of the present improvement is to do away, with certain inconveniences contained in the other machine, and thus enable one person to operate and attend the same, where several were before required. Without engravings it would be difficult correctly to describe the connection of the parts. It will be sufficient to say that the invention is a good one and effects an important saving of labor.]

BURGLAR'S ALARM—H. L. Hervey, of Quincy, Ill.: I do not claim decoys, of themselves, as decoys are not new,

But I claim the combination and arrangement of levers, F, springs, a, stop levers, D and E, slotted levers, C, key levers, B, flat sided levers, G G2, connecting levers, H H2, and links, J, varying the alarm at pleasure, by means of the stop levers, D and E, and for drawing the bolt, as described.

HAND COTTON PICKERS—Geo. A. Howe, of Worcester, Mass.: I claim the endless belt or chain of gatherers, F, stripper, H, bag, R, and case, A A, when combined, arranged, and operated substantially in the manner and for the purpose set forth.

BURGLARS' ALARM—Sam. Hamilton, of Tolland, Mass. Disclaiming the clock devices and bells, I claim constructing an alarm with an actuating pull knob, b b', having a catch spring, c, watch disk, b t, formed with a tube, c', together with the rail, d d d, figs. 3 and 4, the blocks, k k † L, links, n n, hook spring, o x o o, sliding blocks, s t, with catch devices, t' t', the secret spring strip, " † †, through all of which, in combination with clock-work devices are actuated, bells or alarms, J & & &, substantially in the manner described and for the purpose set forth.

BAGASSE FURNACES—S. H. Gilman, of New Orleans, La.: I claim the pit, D, located between the furnace and the boilers, in a passage way, B, as described and for the purpose specified.

I also claim the perforated blast pipe, G and L, of the feed opening, as arranged and described, and for the purpose specified.

FEET WARMERS—Henry Forncrook, of Elbridge, N. Y., I claim the arrangement of the angular supports, C, upon the inner box, thereby providing the foot warmer with a hot air chamber; also with substantial supports for the outer box, in the manner described, for the purposes specified.

MILITARY WAGONS—Jos. Francis, of New York City: I wish to be understood as not claiming the transportation of boats, or segments thereof, in cradles on roads or railroads, as that has before been done.

I claim, first, constructing the bodies of road wagons and like vehicles of corrugated plate metal, supported by a bottom frame permanently attached thereto, so as to serve to support the iron body at all times, and be used as a sled upon which to drag the superstructure, when taken off its wheels, as set forth, and made water-tight for transportation, as specified.

I also claim the mode of attaching and detaching the running gear, so as not to pass any bolts which are liable to wear and cause a leak through any part of the water-tight body, but simply to connect the same with the frame as shown at fig. 3, by the outside connections and braces, so as to securely brace the iron body in proper form, and be permanently united therewith.

CUTTING THE FRONTS AND BACKS OF VIOLINS—Matthias Keller, of Philadelphia, Pa.: I claim, first, the slides B and C, with the pattern, M and J, lever G, and spindle, F, with its cutter, I, the whole being arranged and constructed substantially in the manner set forth, for the purpose of forming any number of exactly similar backs and fronts of violins from one pattern.

Second, the supplementary lever, Q, with its connections, R S and J, in combination with the levers, K and G, and slot, k, for the purpose of forming the concave sides of backs and fronts of violins, without changing the pattern used for forming the convex sides, and for the purpose of giving the said backs and fronts a gradual and correct tapering thickness.

AMALGAMATORS—Edward N. Kent, of New York City: I do not wish to be understood as making claim broadly to an apparatus for the separation of gold or silver from foreign substances, which consists of a vessel containing a column of water with mercury at the bottom, and with agitators above the mercury, and in which the substances to be separated are supplied below the surface of the water, and below the discharge.

I do claim the employment of double action paddle wheels which rotate on their own axis, and revolve about a vertical axis, substantially as described, within and in combination with a column of water in a vessel having the discharge at or near the top, substantially as specified, and for the purpose set forth.

And I also claim sustaining the paddle wheels in the column of water from above, and causing them to rotate on their axis, by the weight of the heavy pan resting on the peripheries above, that mercury may be applied in combination therewith, at the bottom and below the wheels, substantially as and for the purpose specified.

[This valuable improvement was fully illustrated by engravings, and described in our paper week before last.]

LOCKS—Edward Kershaw, of Boston, Mass.: Now, I am aware that locks have been heretofore made with the bolt in the form of a disk, and rotating about a center; and also that tumblers have been used in connection with such lock bolt, which had a movement with the bolt, and parallel to its axis, and were placed in position by pushing in the key; therefore, I do not claim either of these.

But, in connection with a rotating lock bolt, or its equivalent, I claim the combination of the shank, b, and segmental tumblers, C C, with the tubular recess of the lock case enclosing the same, with their several subordinate appendages, co-operating with each other substantially as described.

PUMPS—Hosea Lindsey, of Ashville, N. C.: I claim the horizontal cylinder, E, and pipe, C, connected as shown, the cylinder being provided with valves, b b, and piston rods, F F, the piston rods being operated as the pipe, C, and cylinder, E, rotate by the curved flanch, I, as shown and described, for the purpose specified.

[Mr. Lindsey places his pump at the bottom of the well and operates it in the following manner: A hollow tube extends down the well having a pump barrel attached and placed longitudinally across its lower end. The pump barrel is furnished with a piston rod that extends entirely through; two pistons are attached to the rod, so that when one moves in, the other withdraws; reciprocating motion is communicated to the pistons by means of a hollow cam ring placed in the well on the same level as the piston rod; the tube is revolved at the top of the well by means of a winch; the pump barrel being carried around with the tube, the ends of the piston rod come in contact with the cam ring, and the pistons move in and out, forcing the water up through the tube. There is no limit in the hight to which water may be thus carried.]

LOCKS—J. H. Pomerey, of Bloomington, Ill.: I claim on spring locks or latches the use of the spring bolt or catch, M N, or its equivalent, so constructed as to be operated by the door frame or keeper to release the bolt and fasten the door in the manner substantially as set forth.

PHOTOGRAPHIC BATH—Isaac Rehn, of Philadelphia, Pa.: I claim the overflowing bath, with the conducting trough and receiving chamber, or their equivalents, as set forth.

BOOT TREES—Jas. H. Sampson, of Grafton, Mass.: I claim the combination and arrangement of the three levers and the screw, M, applied to the section A and B, of the tree, and made to operate together, substantially as specified.

I also claim the combination of the spring lever catch with the foot, C, and front section, B, in the manner described and for the purpose specified.

SELF-REGULATING HOT BLAST FOR FURNACES—Chas. Schinz, of Camden, N. J.: I claim the use of the pipe, h h, and the bar, i i, when arranged as set forth, and operating conjointly, by means of suitable gearing upon the eccentrics, v v, for opening and closing the valves, z z, substantially as described, so as to divide a given volume of air of varying temperature and pressure into proportionate parts, and for the purpose set forth.

CLOTH STRETCHING ROLLERS—Nathan Simmons of Providence, R. I.: I claim the cloth stretching roller or cylinder, imparting to its sectional stretchers while the roller is in revolution, consecutive movements, in one direction or away from the middle of the roller, in the order as described, and by mechanism substantially as specified, or any mechanical equivalent

SPOKE MACHINES—Thos. R. Markillie, of Winchester, Ill.: I claim the arrangement of the cam, U, on the patterns V, in combination with the tracer, S, and a spring, a, in the manner and for the purposes described.

I also claim the particular arrangement of the rotary cutter and tracer in combination with the plate that supports them, suspended in the manner and for the purposes described.

MACHINES FOR SCOURING KNIVES—G. M. Morris & J. Newton, of Watertown, Conn.: We claim the machine described and shown for scouring knives, the same consisting of two scouring rollers, D D', and a trough containing the cleansing material, said rollers being arranged over each other above the trough, and each of them formed of a series of woolen, or other absorbent elastic disks, arranged on a screw shaft, E, and forced and confined compactly together by two movable metallic disks, F F', substantially as, and for the purpose set forth.

[The scouring is done by means of two rollers covered with woolen cloth. The knife is placed between the rollers, which are then revolved by means of a crank. Most of the old knife-scouring contrivances are large, clumsy, and hard to operate; but the present improvement is small, neat, portable, and very easily operated. The lower roller turns in a tray which contains the scouring powder or mixture, which is taken up by the roller, and thus constantly brought in contact with the knife The peculiar manner of securing the woolen to the roller shafts, as set forth in the claim, makes the cloth last for a very long time, and prevents it from ever becoming ragged. For family use this invention is truly admirable.

HAND SOWERS—Moses D. Wells, of Morgantown, Va.: I claim effecting the seed discharge and regulating the amount of the same by means of the double inclined planes, f. of bar P, reciprocating without the hopper, the adjustment and operation being substantially as described.

MACHINES FOR PREPARING COTTON SEED FOR PLANTING—R. C. Wrenn, of Covington, Ky.: I claim pads 5, in combination cylinder, 1, and teeth, 1 1 and 4, in combination with hopper slide, combined and arranged substantially in the manner and for the purpose set forth.

CONNECTION BETWEEN REGULATOR VALVE AND GOVERNOR'S STEM—John Tremper, of Philadelphia, Pa.: I claim effecting the connection between the throttle valve cut-off, or other regulator valve and the governor stem, by means of a pin, d, working within a slot, a, or against a bearing face, the said slot or bearing face having an escape opening, b, opposite to which the pin, d, is brought, by the cessation of the operation of the governor, whereby the pin is allowed to escape from the said slot or bearing face, and thereby effect the disconnection of the governor from the valve or cut-off instantaneously, to allow the valve to be closed by a spring or weight provided for the purpose, to stop the engine immediately after the governor ceases to operate, the said pin, d, being attached to the governor rod, and the said slot or bearing face, a, and escape opening, h, being in or upon the lever of the throttle valve or cut-off, or what is equivalent, the pin being attached to the said lever, and the slot or bearing face and escape openings being in the connecting rod of the governor, or in a plate connected therewith, or what is equivalent, by a toothed rack and segment, substantially as described.

[In the ordinary steam engines, no provision is made for the control of the engine in case the governor becomes suddenly inoperative. If, by reason of its driving belt or gear giving way, or by other accidental cause, the governor is stopped, it leaves the throttle valve wide open and the steam full in the engine. An increase in the speed at once takes place, which often results in doing much injury to the machinery.

The principal object of the present invention is to detach the governor entirely from the valve the instant it becomes inoperative, and at the same time to close the valve by means of a spring or weight applied for that purpose, and thus stop the engine. Another object is, to regulate the movement of the valve while the governor is in operation.

We regard the above as an important improvement, and presume it will find a very extensive introduction. It is quite simple in its nature, and readily applied to all kinds of steam engines.]

WATER WHEELS—John H. Gatiss, of Franklindale, Pa., assignor to Abraham Edwards, of Towanda, Pa.: I am aware center vent water wheels have been used, and that the shafts of such wheels, as well as the wheels themselves have been enclosed in a flume, these, therefore, I do not claim.

But I claim the arrangement of the gates, passages, and buckets of a center vent wheel, such as described, so that the water may act upon each bucket simultaneously, and with equal force, first striking them at their very lowest points, and held thereto by the lips or flanges, and then escaping to the center discharge, as set forth and shown

MACHINE FOR CHANNELING STONE—John Taggart, of Roxbury, Mass., assignor to himself and Vernon Brown, of Boston, Mass.: I claim supporting the operative machinery of the drill saws by means of standards, U U, extending down therefrom, and resting upon the bottom of the grooves in the stone, by said drills, the same enabling said operative parts or machinery to move downward with the drills in proportion as they may cut into the stone.

BLIND FASTENER—Daniel E. True, of Lake Village, N. H.: I disclaim the mere combination of bent levers for opening and closing the blind from the inside, as such device is well known, though requiring distinct adjustment for fastening and unfastening the blind.

I claim the arrangement of the spring bolt at the extremity of the outer lever, and connecting said lever with the blind, as described, so as to be self-fastening, and withdrawn by the same lever movement, operating the blind as, and for the purpose described.

[This is a very ingenious and excellent arrangement of levers for opening and closing window blind shutters from the inside of the apartment, without raising the window. There is a lever connected with each blind, which passes through the bottom window-sill into the apartment, where it terminates in an ornamental knob. The blind is operated by simply pulling and pushing the knob, This is one of the best improvements of the kind that we have seen. It is cheap, and easily applied to every window.]

MACHINES FOR PARING AND SLICING APPLES—Levi Van Ilcesen, of New Haven, Conn.: I claim the combination of a spring with a sliding machine, when constructed and combined substantially as described, that is, with an arrangement whereby the fork carrying the apple may be turned, so as alternately to be brought into play with the paring knife, and with the slicing wheel being at the same time thrown into gear in the former case, and out of gear with the latter.

QUARTZ CRUSHING MACHINES—Richard Vose, of New York City: I claim supporting the center of the inclined vessel, A, upon a semi-spherical hub, a, which works in a raised perforated socket in the plate, C, whilst the depressed portion of the periphery of said vessel is supported upon a horizontal plane or track, by which I am enabled to impart the requisite movements to the said vessel, through the medium of a shaft descending from its hub, a, and in connection with the said method of supporting and operating the inclined vessel, A.

I also claim discharging the contents of the said vessel through an aperture in the descending operating shaft, substantially as set forth.

In connection with the described peculiar manner of supporting and operating the vessel, A, I also also claim the combining of the periphery of said vessel with the supporting frame by means of the springs, s s, or their equivalents, for the purpose of steadying the movements of said vessel, and preventing it from turning upon its axis, substantially as set forth.

GIMLET—Chester C. Tolman, of Shelburne Falls, Mass., assignor to James Sargent & Daniel P. Foster, of same place: I claim constructing the lower or outer of the two screw threads or flanches, B B, of the gimlet in rounded or curved paratolic form, and having the sides of said portions of the threads or flanches brought to a sharp or cutting edge, the screw or worm, c, being used or not as desired.

[The spindle of this gimlet is provided with two screw threads, which, at the lower end of the spindle, are sharpened into cutting edges, as set forth in the claim. The result is, that the gimlet cuts its way through the stuff with remarkable ease and rapidity, making a smooth hole, and never clogging up. Cheap, simple, and effective, this implement, we feel confident, will become a public favorite.]

MACHINERY FOR OPERATING AND FEEDING COTTON TO THE GIN—Major B. Clarke, of Newman, Ga.: Having described my machine for opening and cleaning cotton, preparatory to ginning, I claim the arrangement of the toothed feeding roller, a, the adjustable gate, b, and the adjustable comb, c g, with each other, substantially in the manner and for the purpose set forth.

RE-ISSUE.

MACHINE FOR STICKING PINS IN PAPER—Samuel Slocum, of Providence, R. I. Patented Sept. 30, 1841. Extended Sept. 30, 1855: I claim separating the pins laterally, one by one, from the lower end of a pile, sliding by gravity between guides, by combining with such channel way, between guides, or grooved or notched instrument, substantially as described, so that when the groove or notch is brought in the line of the channel way, the lowest pin of the pile shall enter the groove or notch, and by the lateral motion separate it from the pile without any conflict of the heads, the surface of the said instrument beyond the groove or notch acting as a stop to prevent the further descent of the pile until a groove or notch be again brought in line, substantially as set forth.

I also claim the channel way between guides for the descent of the column of pins by gravity, substantially as described, in combination with one or more guide grooves, and one or more followers, working in the guide grooves, substantially as described, whereby the pins, after being separated, can be transferred, as described.

And I also claim, in combination with one or more guide grooves and one follower connected therewith, substantially as described, for guiding the pin or pins as pushed foward, the employment of a clamp or holder for clamping or holding the paper in the required position during the operation of inserting the pin or pins.

And finally, I claim, the combination of the channel way for the column of pins between guides, the guide groove or grooves, or notches, the follower or followers, and the clamp, or equivalent therefor, substantially as, and for the purpose specified.

Recent Foreign Inventions.

Jean Panet, a French inventor, has taken out a patent for propelling cars on railroads by a column of water taken from a fall of water. The method is described by him as follows: "The railway is constructed in the ordinary manner of existing railways, but between the two lines (the same tube serving for both) and along the entire length a tube is sunk into the ground at a depth of from 1 foot 6 inches to 3 feet. This tube receives casings to receive smaller ones for the pistons by which the motion is given; these smaller tubes, again, are furnished with valves and levers. The principal tube is closed at its upper extremity, and at the upper part water is introduced from a brook or river where there is a fall of water. It will be found that the water introduced into the tube exerts an equal pressure on every part of it, and gives the necessary power. The carriage is moved by the force of the water contained in the reservoir tube, and may be constructed with four or six wheels; it is furnished with two levers, four balances, and one slide for moving them. The levers are placed one on each side of the carriage, serving to regulate the opening of the valves; the levers and balances are arranged in pairs, and in such a manner that they move in an opposite direction, so that the speed can be regulated at will, and they are fixed or movable by means of the slide; the balances receiving the pressure from the pistons give the motion."

The advantages of this invention M. Panet sets forth as follows: "Water being the principal agent, there is no fear of scarcity of propelling power, as it can be renewed in the course of the distance by introducing a fresh supply of water as often as may be deemed advisable. The water, after having been employed for propulsion, can be used for various purposes in those parts where it is scarce. But the chief advantages of the system are, that no fuel would be required, and no explosions would take place."

M. Panet would have a fine field for putting his invention into practice on the Lockport and Niagara Falls Railroad, by employing the waters of the Niagara river for a propelling agent. But would this plan answer the purpose of railroad propulsion? Could it be used as economically as steam, and at the same time give as good results? It could not. The water from the highest falls in the world would be too sluggish in its action in comparison with steam, and would not answer the purpose of quick railroad propulsion. It is not the mere cheapness of the propelling agent that we now regard in modern engineering and commercial enterprize. If it were otherwise, no steamships would now be navigating the ocean, as the wind for driving sailing vessels costs nothing.

PREVENTION OF THE ALTERATION OF NOTES, BILLS, &c.—Wm. Ross, of Falcon Square, London, has recently patented an invention for preventing the alteration of bank bills from one denomination to another. During the manufacture of the paper, when in a pulpy state, the characters or letters which indicate the denomination of the bill, whether "five," "ten," and so on, are imprinted upon it. This is accomplished by water-lining in the ordinary manner. To render the character impressed more apparent, it is proposed to print the words in colors, in such a manner that will secure the color penetrating the paper itself, which, by this means, will become part and parcel of the material, so that erasure will be impossible, without accomplishing the utter destruction of the substance upon which the impression is made.

It is estimated by Septimus Piesse that the total revenue derived from various sources, from the substances with which "Britannia perfumes her pocket-handkerchief," cannot be less than $200,000 per annum.

The Chicago *Press* announces the discovery in La Salle County, Illinois, of deposits of cannel coal, in sufficient quantity to meet any demand that may be made upon it for fuel or manufacturing purposes.

During the past year, 82,199,190 pounds of tea were exported from Canton to England 5,895,490 pounds to Australia, and 31,007,115 pounds to the United States. 51,678 bales of silk were exported to England, and 1494 bales to the United States.

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[For the Scientific American.]

Improvements in Railroads.

The improvement of our railroads is a subject that not only affects the dearest interest of the companies but the whole people, and the best efforts of civil engineers should be directed to that branch of their business till the limit of speed depends upon the capacity of the engine.

The defects of the permanent way are very few, and most of them can be cheaply and speedily improved, and when the superstructure is built that is worthy to receive a rail, no doubt a rail will be found that shall not be a particle behind the structure in its perfection.

EARTHWORK—To commence at the foundation of the whole system, solidity is the great thing to be acquired, and upon that one idea is based the whole of the great results that have been, and are yet to be achieved.

Water is the great destroying element of all earthy structures, and its entire absence in the foundation of the road bed would soon place it beyond the action of frost or any perceivable deflection by the weight of the moving train. As it cannot be prevented from falling upon the surface, the next best thing that can be done is to remove it as soon as possible. A drain should be dug from three to four feet below the surface and tile laid therein, which will ensure its speedy removal in the most retentive soils. The experiment has been tried by experience agriculturists with complete success; and soils that could not be drained by open drains have been made productive by the covered drain, and at less cost. A covered drain, of sixteen inch caliber, seems to draw as much water from a field in the same time as an open ditch of ten times that capacity, so that, without doubt, a pipe drain of small size would do more towards removing the water from the road bed than both of the open ditches at the sides.

But falling water is not the only source of annoyance; it is raised in the embankments by capilliary attraction to a great hight, but depending upon the character of the soil. In clay, loom, or sand, if water stands in the hill ditches it affects badly the permanency of the bank, no matter what its elevation may be, it reaches the surface of either of those soils, and completely saturates them, so that the ballast gradually sinks. The only method of preventing its rising to where it can affect the ballast is to cut it off with a drain; for if there is a free passage for the water where it can flow easily and quickly, it will surely find it, even if it is surrounded by compact clay. Circumstances will govern the number, size, and length of such drains, and the calculations are as easily made as for any other branch of railroad engineering.

Side ditches, however, should not be neglected. On the contrary, they should receive more attention than they ever have had. Water should not be permitted to stand in them on any account. The appearance, health of the country, and inconvenience of crossing, are not the only reasons for the abatement of the nuisance; they too often afford good watering places for the cattle at the crossings, besides a very tempting one for the neighboring farmer's stock. Thorough draining is the main thing needed to ensure the stability of the road-bed, and until that is effected, no great improvement need be looked for in the "permanent way."

BALLAST—Gravel which comes the nearest to broken stone in quality—that which is neither too coarse nor too fine, which will pack firmly, and at the same time afford an easy escape for falling water—should in all cases be preferred. Inferior kinds might possibly be used over a drain, but if too fine, it will hold too much water, if too coarse, it cannot be well packed around the ties; an even, uniform, medium quality is preferable, and for a term of years will pay the extra cost of transportation. Clean sand has been used to a great extent, but would be far better were there a drain beneath it. Water will run up a bank of sand to a great hight if there is any in the ditches at the sides. In the drouth of 1854, six inches below the surface of a 10 feet embankment of clean beach sand, it was damp enough to pack into a ball.

The manner of using ballast is almost always left to the care of those having little or no interest in its application—whose philosophical or mechanical knowledge is below the medium. The only idea with them has been to get it under the ties, so as to make a hollow between them, and such a thing as packing the gravel anywhere excepting there has never entered their heads.

To ballast a road with gravel like children's playing marbles is the hight of folly, for the weight of the train causes the ballast to rise between the ties, and affords no permanency, yet this is the way most of the roads are ballasted. When ballast is placed upon the road-bed before the track is laid, it would be a grand plan to lay it about four inches thick, then go over it with a very heavy cast-iron roller, then another course of gravel and another rolling, and so on until the required depth was on; but if it is deferred until the track is laid, no very heavy trains should be allowed to move till the gravel is under and well rammed down. If this precaution be not taken, many of the rails will be bent, and will have to be replaced by straight ones, at great cost.

TIES—Durable timber, of good size, firm texture, and well seasoned, are the requisites of a good tie, and any one not answering this description should not be used. They ought to remain sound at least ten years, be large enough to give a good surface for the rail on one side, and a good bed upon the ballast on the other; firm enough to hold a spike well, and be well seasoned as a pre-requisite to soundness and firmness. A tie of soft wood (cedar, for instance,) *gives* beneath the rail, and if placed between two hard ones is as bad, practically, as though it was not well tamped up, for the train sags at that spot,—every wheel of the train sinking lower and lower. It is just as bad if the tie be small, for it cannot receive that support from the ballast that a large one does, neither can it give the bearing to the rail. If all the ties were equally firm on the ballast the smallest would not hold their faces equally well, for the concussions of a moving train tend to loosen them all, and the smallest must suffer first. As long as the jointed rail is used, more care will be required at this point than any other, unless a more perfect chair is introduced, or a short cross tie be found to answer more perfectly. Believing, however, that a perfect rail will be, if it has not already been invented, this imperfection, of course, will cease, and the ties will then have to be arranged in classes. They should first be selected as regards their firmness, and subdivided according to their size. If small, more of them should be used in the same space, and none but the best white oak should be used on a curve.

CURVES—The elevation of the outer rail is too often left to the judgment of the track repairer, who is just as apt to get it too high as to have it too low. In either case it is wrong. The elevation that will exactly overcome the centrifugal force of the moving train at a certain rate per hour should in all cases be known, and all trains that are above the rate of freight trains should be required to conform to the standard in going round these curves. The concussions will then be comparatively light, if the calculations are perfect.

Parabolic curves give in practice all that is claimed for them in theory, and would be one of the great improvements to be introduced as the rule and not the exception in this country. Other improvements, undoubtedly, will be suggested by those who have seen the defects of the system, for such I consider the above to be; but these are the main ones, and until they are radically improved or a new system substituted, we shall be content to move some thirty miles an hour.

H. DE L. S.

Pompey, N. Y.

Gun Cotton and Gunpowder.

Inquiries having been made of us lately as to the use of gun cotton, and whether it could take the place of gunpowder, we have obtained the following information on the subject from the Smithsonian Institution, viz.:—Gun cotton cannot be made with anything like the same uniformity in strength as gunpowder, and its explosive property diminishes on being kept for any length of time. It can be used with safety in the discharge of fire-arms, but not with as much safety as powder. Its cost, weight for weight, is a little more than gunpowder, but owing to greater strength, force for force, it is cheaper. The Governments of France, Prussia, Austria, Russia, and England, have made a great number of experiments on the use of gun cotton in fire-arms, and in all cases the reports of the engineers engaged in making the experiments were against its adoption in the place of gunpowder. In blasting rocks it is used extensively. The objections to its use are the inequality of its action compared with gunpowder, the effect on the gun is greater, its projectile force varies with the compression of it in the gun, it attracts more moisture, alters slowly from loss of acid, explodes under some circumstances at 154 deg. [Washington Star.

Adjusting the Number and Depth of Paddle-Wheel Blades.

It appears that something more may be said upon paddle-wheels; we will therefore remark, that so long as the common rectangular floats continue to be used, the number and depth of them should regulate each other upon the principle "that the right-angled resistance from the surface of one paddle at its central (or upper) edge, should pass below, and entirely clear of the paddle before it." It is upon this principle that we can account for the results of experiments where, sometimes, one-third of a steamer's blades have been removed from their upper edges without diminishing the speed, but rather improving it. In such cases the arms have been too numerous for the *width* of the blades. All the upper parts, which extended above a point, from which a line drawn at right angles to the arm would pass to, or below the lower edge of the blade before it, was disturbing the fluid to no good purpose, but rather loading the wheel with dead water, which, instead of pressing against the ocean, impinged upon the pre-dipping paddles. If an equable distribution of resistance shall continue to be approximately sought in the periphery of common paddle-wheels, by using a large number of blades, instead of seeking for it in the true form of propelling blades, let the depth or breadth of the floats be reduced, as above, and subsequent changes will be found unnecessary. How many wheels have become *water* instead of "paddle" wheels, by *guessing* at the proper number and depth of their blades!—[U. S. Nautical Magazine.

Pennsylvania Soapstone.

An American in London, in a communication to the *London Mining Journal*, states that the same causes which contributed to the formation of soapstone in Cornwall, seem to have produced the same result in Pennsylvania. He says:—

"On the banks of the river Schuylkill, ten miles above Philadelphia, the gneiss which, alternating now and then with mica schist and porphyry, has prevailed for the whole of that distance, is succeeded by an extensive tract of serpentine. The gneiss is much invaded by veins of trap and granite; and, at the junction, a great dyke of granite shows itself crossing the river. It is at this precise spot that the soapstone, in massive, irregular deposits, is seen. Nodules of serpentine are included in the deposit. The citizens of Philadelphia have good reason to remember this soapstone, since for a long time the doorsteps of their houses were invariably made from it. The rock wore away more speedily than the serpentine, which protruded in hard, indestructible, rough balls, not very genial to the soles of one's shoes. It is now wholly replaced by marble for doorsteps; but, for lining furnaces, where great heat is to be encountered, the soapstone is still extensively quarried and applied. It occurs on both sides of the River Schuylkill, here 300 feet wide, and on the east side is not less than 40 feet thick.

A singular fact attending the occurrence of this deposit may also, be here mentioned. The soapstone is interspersed with little nodules of iron pyrites. The portion of the rock in which this is most abundant wears off into a sugary substance. On being analyzed by a young Philadelphian amateur chemist, Theo. Rand, this substance was found to contain 8 per cent. of epsom salts—(sulphate of magnesia.")

Foolscap Paper.

Every body knows what "Foolscap paper" is, but would perhaps be puzzled to tell how it came to bear that singular cognomen. Well, when Charles I. found his revenues short, he granted certain privileges amounting to monopolies, and among these was the manufacture of paper, the exclusive right of which was sold to certain parties who grew rich and enriched the government at the expense of those who were obliged to use paper. At this time all English paper bore in water marks the Royal Arms. The Parliament under Cromwell made jests and jeers at his law in every conceivable manner, and among other indignities to the memory of Charles, it was ordered that the Royal Arms be removed from the paper, and the fool's cap and bells be substituted. These also were removed when the Rump Parliament was prorogued, but paper of the size of the Parliament's Journals still bears the name of "Foolscap."

Iron Rigging for Ships.

Two lines of ships (of about 800 tuns each) are running between Glasgow and Montreal, Canada. They are built of iron, and all their shrouds, stays, back stays, in fact, all their standing rigging is made of wire rope, with hemp centers, like that used on some inclined planes of railroads. This rigging looks very light, and is, in fact, lighter than hemp of equal strength. It holds less wind, and is not subject to stretch after being once set. Each shroud or stay terminates in a screw, by which it can be strained to any desired extent, and two men, in a couple of hours, can set up all the rigging, even in a storm. An improvement in the hanging of the yards is adopted in these ships, by which the yards are made to turn in their lifts, and roll up the sails upon them, from the deck, so that it is never necessary to go aloft to reef or furl them. These ships use the American steering apparatus, having a right and left handed screw upon the axis of the wheel, with rods from the screw boxes to a short tiller on each side of the rudder head, instead of the tiller rope.

Foot Prints of Reptiles in the Coal Strata of Pennsylvania.

At a recent meeting of the Boston Society of Natural History, Professor Wyman read an article on the foot-prints recently discovered by Professor Henry D. Rogers, in the Carboniferous Strata of Pennsylvania. He gave an analysis of the anatomical characters by which reptiles and fishes are distinguished from each other. He made comparisons between the form and structure of reptiles and the fins of fishes, showing that although they resemble each other as regards their functions, yet morphologically they are always distinct. There is no known fish, recent or fossil, the pectoral or ventral fins of which could produce a series of traces like those discovered in the coal strata of Pennsylvania by Prof. Rogers.

Prof. Wyman, therefore, thought that, in the present state of knowledge, there was no ground for denying that the quadruped tracks found in the coal formations were made by reptiles.

To City Subscribers.

So many complaints are made by our city patrons of the non-receipt of their paper by the carriers, that we would advise all who are about to commence taking the paper to call for it at the publication office, or obtain it at a periodical store in their neighborhood. One or two of the carriers serve the paper regularly; those the public, in their districts, know, and will continue to patronize; but others who serve it are so dilatory and unreliable that our subscribers are exceedingly annoyed by them, and blame us for an evil which is not in our power to remedy. Persons who will run their own risk in having the paper served them, may leave their names at our office, and they will be handed to a carrier, but we will not vouch for his faithful srrvices, nor receive money for him.

The SCIENTIFIC AMERICAN can be found in all the periodical stores in this city, or Brooklyn, on the Thursday preceding the date of publication each week, or at the Office. Price 4 cents per copy.

Brilliants of Fahlun, so called, are made from 29 parts of tin and 19 parts of lead. They are a very fusible and brilliant alloy.

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New Inventions.

Reports of Railroads.

OIL—The custom adopted by the New York and Erie, and the Great Central New York Railroad, of keeping a correct record of the work done by each locomotive, and the different items of expense, and publishing monthly reports, must do good, by showing the directors, superintendants, engineers, and all concerned in such accounts, where the greatest loss is caused, and where the greatest gain is obtained. The Report of the General Superintendent, C. Vibbard, Esq., of the New York Central Railroad, for September, shows the number of miles run by each engine, and the quantity of oil used. The average number of miles run to one pint of oil was 16 69-100—two miles more to the pint than in the previous month. The engine *W. W. Corcoran*, ran 50 65-100 miles to one pint of oil. This was the highest rate; the lowest only 6 13-100 miles, was by the locomotive *Syracuse*. It must have been sadly out of repair. What is the cause of the *W. W. Corcoran* performing so well? In the report for last month of Edward H. Jones, Master Mechanic of Albany & Utica division of the above railroad, we find that there was nearly two miles less run to the pint of oil than during the previous month. Has the maximum economy of oil been obtained on this railroad? We think not. We have no doubt but the engineers on this railroad will yet show a higher rate of duty done by the engines to one pint of oil than they yet have shown.

FUEL—The monthly reports of General Superintendent D. C. McCallum, Esq., of the New York and Erie Railroad are more elaborate than those of the Central Railroad. They embrace the work done by each engine, and give all the expenses separately. In his report for the last month (October,) we find that the average number of miles run to one pint of oil was 16 4-100—nearly two miles more than the previous month.

The general average of miles run to one cord of wood was 27 29-100—about two miles more than the previous month—while the average cost was four cents more, thus showing a decrease in the expense, no doubt; but the increasing cost of this kind of fuel is a serious question. On the eastern branch of this railroad the wood costs $5 71 cts. per cord—a very high price—while on the Buffalo division it costs only $2 94 per cord, and yet the expense of fuel per mile for drawing a tun load on this branch is about as much as on the Eastern branch. The engines on it seem to have been but half as economical of fuel. There is room for improvement here, and the energetic Superintendent will soon stick a pin in that spot. Fuel is the largest single expense, the average being 13 22-100 cts. per mile run; the repairs of engines amounts to 6 5-100 cts. per mile; oil and tallow, 1 23-100 per mile. Every effort must be directed to economize the fuel. No less than 12,516 cords were consumed on this road during the month of October; this amounts to (12,516×8÷5,280) 18 96-100 miles of cord wood, 4 feet high and four feet wide, and cost $45,016 68. Such a destruction of forest, amounting to 236 miles of cord wood per annum on this single road, must soon render such fuel scarce, and consequently dear. Coal-burning engines or cheap coke are the remedies to which all our railroad managers and engineers should be directing intense attention.

Spontaneous Combustion.

A correspondent, speaking of the fire at the coal mine at Beaver Meadow, Pa., which, it had been supposed, originated from spontaneous combustion, states that such is not the fact; that the fire in the dirt heap or coal dust at that place was the result of carelessness on the part of the managers of the mine, who allow their firemen to wheel or cart the hot ashes from the engine furnace on to the "dirt heaps." There are now, says our correspondent, three veins of coal on fire, or perhaps the same vein in three different localities, in the anthracite coal fields of Pennsylvania, but they have all been ignited by the carelessness of the miners. The first was set on fire at Coal Castle many years ago, and is still burning, like a slumbering volcano, having destroyed, probably, millions of tons of coal, as the vein is the celebrated "Jugular," which varies from 60 to 120 feet in thickness. The second was recently set on fire at Tamaqua by some miners who were digging their winter's coal at the outcropping of the vein; and the third is the subject of remark at Beaver Meadow.—[Philadelphia Ledger.

[Would it not pay to extinguish this fire by forcing steam and carbonic acid gas into the mines, as was accomplished a few years since by Goldsworthy Gurney, in England. The burning coal mine which he extinguished had been burning for a longer period than those in Pennsylvania.

WEBER'S PATENT FARM GATES.

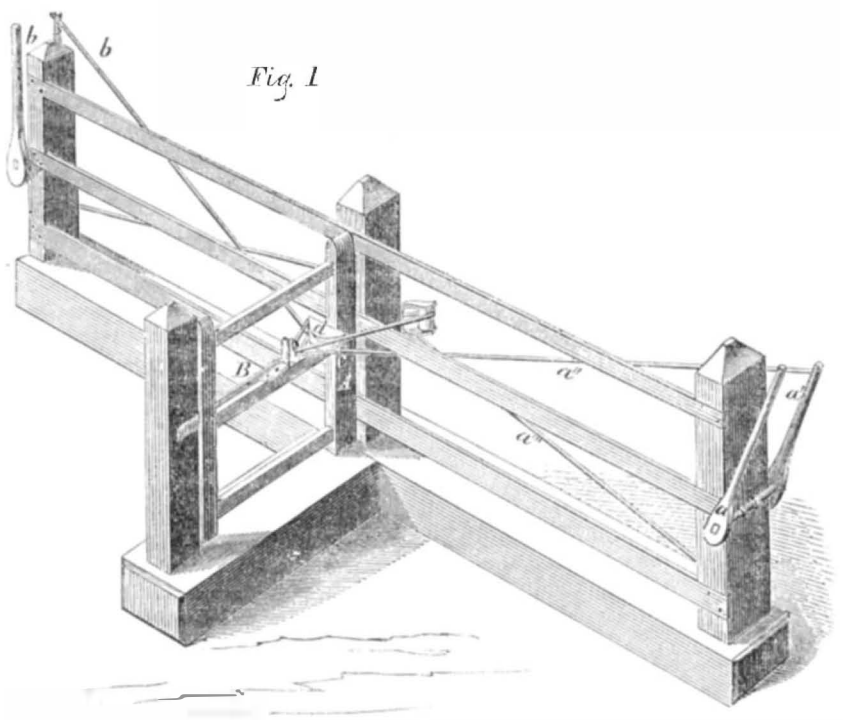
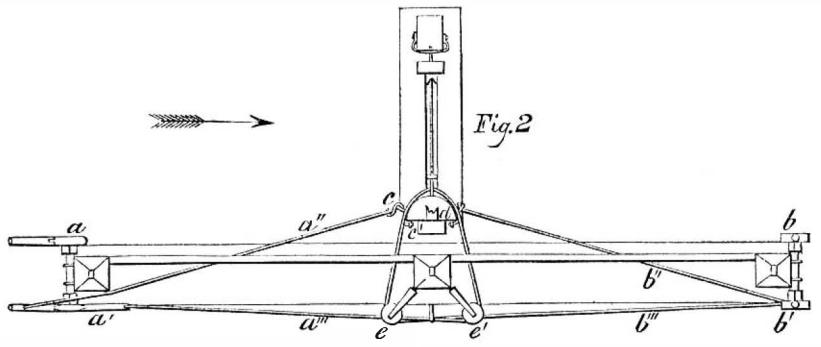


Fig. 1 of the accompanying engraving is a perspective view, and fig. 2 is a plan view of a method of operating gates for farms, for which a patent was granted to John K. Weber, of Seneca Falls, N. Y., on the 9th of October last.

The nature of the invention consists in the peculiar mode of opening and closing gates, which are so hung as to be opened and shut both ways, and a person riding in a vehicle or on horseback can, without dismounting, open the gate, and close it after he has passed through.

The gate A, is hung upon pivot or swivel hinges, so as to swing freely both ways, and is fastened by the spring bolt B. On either side of the gate there is a set of levers and cords so arranged and connected with the gate and spring bolt as to open the gate in a direction from and in front of the person passing through. The two sets are alike in arrangement and operation, and a description of one will answer for both. The lever, *a'*, is worked by the hand lever, *a*, as shown in fig. 1. The cord, *a*2, is attached by one end to the top of lever *a'*, and by the other end at *c*, fig. 2, to the semi-cylindrical segment, *d*, which is firmly fixed to the gate. The cord, *a*3, is attached by one end to the lower part of lever *a'*, and after passing over guide pulley *e*, fig. 2, and around the periphery of the segment, is attached by its other end to the segment at *c'*, fig. 2. It will now be seen that if the lever *a* is pushed forward by a person riding in the direction of the arrow, the upper end of *a'* is carried forward, and its lower end backward, and that the action of the cord, *a*3, will be to open the gate in the direction of the arrow, and that the reverse motion of the lever, *a*, would shut the gate by means of the cord, *a*2. The cords, *b*2 *b*3, from the upper and lower ends of lever *b'*, are arranged and operate similarly to cords *a*2 *a*3, except that they operate to open and shut the gate in a different direction. The cords, *a*3 *b*3, pass through a loop to keep them in place on the



pulleys, *e e'*. It will be readily seen that a gate of this description must be fastened when closed, or it could be opened by the wind or by cattle in either direction, and in order to fasten the gate and control the fastening by means of the levers, *a* and *b*, the cords, *a*3 and *b*3, pass through a loop on one end of the spring bolt, B, and as these cords alternately slacken and are drawn tight by the alternating motions of the levers, the spring bolt will be withdrawn and allowed to return to its place.

The gate is shown with a fence on one side; and it will be understood that when it is opened as described, by a person advancing in the direction of the arrow and putting up the lever, that it remains open until he passes through and closes it in the same way on the other side. The claim is for the arrangement of the levers, *a a'*, *b b'*, cords *a*2 *a*3, *b*2 *b*3, in combination with the spring bolt, B, for opening and closing the gates both ways, in the manner set forth.

By addressing communications to Mr. Weber, at Seneca Falls, more information respecting rights, &c., may be obtained.

Who'll take the Prizes?

Competitors for the large prizes to be distributed by us on the first of January, are reminded that the time for them to act is short. Fifteen will win, while others must suffer disappointment. The question is, who will be the fortunate ones? The answer is, those who have exerted themselves the most, and obtained the largest number of subscribers. To some who have entered the arena of competition, the addition of a few more names to their lists, perhaps a single one, will save them the mortification of defeat. Think of that fact, and act accordingly.

The Hillotype Again.

The Rondout (N. Y.) *Courier* announces that the Rev. L. L. Hill has at last completed his invention of the Hillotype, and "has received an offer of $30,000 provided he will go to Europe and obtain patents. This he does not deem a sufficient consideration for so brilliant a discovery." What a conscience. It is also stated that "he has recently made a great addition to his invention by reproducing the colors of nature on callodionized glass, and has relieved himself of the difficulty of using silverized plates."

Awards to American Exhibitors at the French Exhibition.

We publish herewith a list of the principal awards made to American Exhibitors at the French Exhibition,—nearly every article sent from the United States either received a medal or was honorably mention by the International Jury. We have not room for the whole list.

GRAND MEDALS OF HONOR.

C.H. McCormick, Chicago, Reaping Machine

Chas. Goodyear, New York, India Rubber Goods.

MEDALS OF HONOR.

J. A. Pitts, Buffalo, Grain Separating Machine.

Bache & Saxton, Washington, Weights and Measures.

Lieut. Maury, Wind and Current Charts

MEDALS OF THE FIRST CLASS.

Tousley & Reed, New York, Steam Engine.

J. H. Manny, Rockford, Reaping Machine.

M. Allston, South Carolina, Rice Samples.

Thos. Blanchard, Boston, Wood Bending Machine.

E. Richmond, Boston, Metal Cutting Machine.

I. M. Singer & Co., New York, Sewing Machine.

David King, Albany, N. Y., Model of Steamboat.

Secretary of the Navy, Model of a Vessel

S. Colt, Hartford, Ct., Revolvers.

Merriam, Brewer & Co., Boston, Cotton Goods.

W. S. Seabrook, South Carolina, Cotton Samples.

A. W. Ladd, Boston, Pianoforte.

A. Mirmont, New York, Violins.

C. B. Stuart, New York, Dock and Steam boat Model.

MEDALS OF THE SECOND CLASS.

Z. Thompson, Vermont, Specimens of Forest Wood.

John S. Wright, Chicago, Harvesting Machine.

Wethered Brothers, Baltimore, Steam Engine (super-heating.)

John Harraday, New York, Machine for Cutting Clothes.

Sanborn & Carter, Portland, Me., Book Backing Machine.

F. & A. Wolle, Bethlehem, Pa., Paper Bag Machine.

Grover & Baker, New York, Sewing Machine.

Wheeler, Wilson & Co., New York, Sewing Machine.

J. Seymour, Newark, N.J., Sewing Machine.

Fowler & Preterre, New York, Dentistry.

J. Gurney, New York, Daguerreotypes.

G. Gemunder, New York, Violins.

HONORABLE MENTIONS.

Vergennes Scale Co., Vermont, Platform Scale.

Backus & Peaslee, New York, Machine for Washing Rags.

Nelson Barlow, New York, Planing Machine.

C. Kline, New York, Chronometers.

Storms Brothers, Nyack, N. Y., Wooden Ware.

N. W. Kingsley, New York, Dentistry.

Benj. Moore, New York, Sawing Machine.

J. T. King, New York, Steam Washing Machine.

Meade Brothers, New York, Daguerreotypes.

Thos. Maskell, Franklin, La., Sliding Keel.

N. Thompson, Jr., New York, Life Preserving Seat.

Madame Delpit, New Orleans, Snuff,—besides many others.

W. J. Valentine, President of the American Commission, residing in Paris; Marshall Woods, of Providence, R. I., Member of th Jury, and Alexander Vattemare, for services rendered in the American Department, were created by the Emperor, Chevaliers of the Legion of Honor.

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Scientific American.

NEW-YORK, DECEMBER 15, 1855.

Protection of Designs for Articles of Manufacture.

We learn from a recent number of the Philadelphia *Ledger* that petitions are now in circulation in that city to obtain signatures, requesting Congress to extend the laws of copyright to all original designs to be printed on paper or cloth, or woven with other fabrics, and all original designs of forms or for ornamenting any article of manufacture, so that the author or proprietor of such original design shall be entitled to an exclusive property therein for a term not less than three years. The *Ledger* takes occasion to commend this movement as a very proper one for the protection of persons engaged in the business of originating and preparing designs for articles of manufacture. It says:—

"Without such protection it is in vain to look for that improvement in manufactures which will enable our manufacturers to compete with the most expert and skillful of other nations. Those who expend money in improving their productions ought to have the benefits of such improvement. If they may be seized and used by others, without compensation, the moment they are perfected and made public, the inducement to persevere in such inventions is destroyed, and our manufacturers will be content, therefore, to be the servile copyists of others, and always be behind them in originality and skill Designs are just as much the result of labor, of money, and mind, as books and machines, both of which enjoy the benefit of legislative protection for definite periods of time, and the effect has been to stimulate, in a high degree, both of these departments of intellectual labor."

The remarks of the *Ledger* exhibit a true sympathetic spirit with inventors, but such a movement in the city of Philadelphia, rather surprises us. Such a law as the petitioners referred to pray for, is now in existence, and every new and original design can be protected by it, not for three years merely, but for seven years. This law was passed on the 29th of August, 1852. Section third of the Act says:

"A citizen or citizens, who, by his, her, or their own industry, genius, efforts, and expense, may have invented, or produced any new and original design for a manufacture, whether of metal or other material, or materials, or any new and original design for the printing of woolen, silk, cotton, *or other* fabrics, or any new and original design for a bust, statue, or bas-relief, or composition in alto or basso-relievo, or any new and original impression or ornament, to be placed on *any article of manufacture;* or any new and useful pattern, or print, or picture. either worked on, or printed, or painted, or cast, or otherwise affixed on any article of manufacture," &c., "on application for a patent to the Commissioner of Patents, on due proceeding had he may grant a patent therefore," &c.

This law fully covers all articles of design and ornament, and grants the authors of such, protection in their invention for seven years. The people of Philadelphia do not require any new law to *protect* the class of objects named by the *Ledger*, as the present law is very full and complete, embracing the marks adopted by tradesmen to distinguish their own manufactures, as well as all designs of artists.

The present law, however, might be amended so as to reduce the patent fee from $15 to a smaller sum, such as $5, or even one dollar. Very few artists or manufacturers (excepting those engaged in the stove business, who thus exhibit great spirit,) take advantage of the law for protecting patterns, or articles of design; and we think it must be owing to their want of knowledge regarding the existence and provisions of such a law, or else it must be owing to the fee ($15) being too high. We have no doubt but far more articles of design would be patented, if the fee were reduced to five dollars. As this sum would be sufficient to cover all the expenses of the Patent Office, in registering designs, it would be an act of national policy to reduce the fee to this standard. We have been informed that most of the designs or patterns used in our calico, oil cloth, and paper print-works, are mere copies from the French, and simply for the reasons assigned by the *Ledger*, namely, that it will not pay to expend much money in getting up new designs, because they are seized upon and made use of by others in the same line of business, whenever they are made public. Now, while the fee of $15 for a patent on a good design, can offer no excuse for a manufacturer not protecting every beautiful new pattern or design, we also believe that a cheaper means of protecting designs would promote a spirit to get up more original ones, and thus improve the national taste—transforming our pattern artists into original designers, instead of mere copyists of foreign patterns and designs. Our people have a fine taste for the beautiful; of this they have given samples to the world in the persons of West, Stewart, Alston, Cole, and a host of other distinguished painters; and in the persons of Powers, Greenough, Crawford, and other sculptors.

We go for the encouragement of improvements in all things—in articles of taste as well as utility. If by reducing the patent fees for designs from fifteen to five dollars, will be the means of encouraging a taste for getting up beautiful original designs for machines such as lathes, frames of steam engines, &c., calico patterns, &c., and even handsome labels for parcels, we go for it, with all our heart: "progress and improve," is our watchword.

The Manufacture of Coke.—Railroad Fuel.

The substance named "coke" is simply *coal charcoal.* It is but little known in our country except in cities where gas is made from bituminous coal, and in those localities where iron is manufactured in the neighborhood of our bituminous coal fields. In England it is manufactured on a most extensive scale in all the coal mining districts, and is used extensively for smelting iron, copper, and other ores. It is employed in all the brass and iron foundries there, and is the only fuel used on locomotives. The manufacture of it, therefore, is an important business in that country, and why not in ours? We have bituminous coal fields of an area so large that those of England, in comparison to them, are like mere onion beds to extensive plantations; and yet we have been informed that the quality of our coal is unsuited to the manufacture of coke, and in this respect is inferior to English coal, especially for locomotive fuel. We do not believe this; we are confident that as good coke for fuel can be made from some kinds of American coals as from English coals. If so, would it not be well to manufacture it, and use it on railroads as a substitute for wood fuel? The price of wood is continually rising in the Eastern States, and the railroad companies must soon be driven to adopt some other kind of fuel. Thus, on the Western or Boston and Albany Railroad, the bill for fuel last year exceeded that of the previous one by $50,000, and that of the previous year exceeded that of 1852 by $50,000. The increasing expense for wood on this railroad has greatly exceeded the natural increase of business, and the Directors of it are deeply impressed with the necessity of obtaining a cheaper substitute. If coal-burning locomotives can be made to run more economically, and can be as easily managed as those which now use wood, then nothing more is wanted, for assuredly, it must be more economical to use anthracite coal for fuel than to use cooked coal, (coke) or wood. But if good coke can be obtained cheap, there is no difficulty in the method of using it for locomotive fuel, like that which has hitherto been experienced in the caking of anthracite coal in the fire-boxes of these engines. We apprehend that the coke which has been tried and condemned on several railroad experiments was not well made. We know that in some experiments made on the Hudson River Railroad with the coke obtained from our city gas works and some from Pennsylvania, the former proved to be far superior, and for the simple reason, we believe, that the coal from which it was made was subjected to a much higher heat in the retort than the Pennsylvania coal, which was coked in ovens. There is a manifest advantage in subjecting bituminous coal to a very high heat in coking it. The longer and higher the heat to which it is exposed the more it contracts, and consequently the more dense it becomes. We are of the opinion that our coke burners do not subject their coal to such a high degree of heat, nor do they maintain the heat so long as they should do in their coke ovens. These defects in the manufacture of coke, rather than the quality of our bituminous coal, we are of the opinion, have been the cause which produced the defective coke that was experimented with and condemned on several of our railroads.

It may be said that coke can never be manufactured cheap enough at our great bituminous coal fields in the valley of the Ohio, so as to be carried to the East and used for fuel; it having more bulk than anthracite coal, its carriage must be more expensive, therefore it is much wiser to exert every energy to incite every faculty of inventors to produce perfect anthracite coal-burning locomotives. These reflections are indeed worthy of being acted upon; they touch the very root of the matter, but at the same time they should also excite the owners of mines in our bituminous coal fields to greater exertions in the manufacture of good coke. All the volatile products of coke ovens have hitherto been allowed to escape into the atmosphere, no attempt has been made to save them. Now we believe that it might be found profitable to manufacture a superior kind of coke, save the volatile products, and employ them for useful purposes, especially the ammonia contained in them, which might be saved and converted into valuable salts for agricultural purposes.

We have received communications from time to time, from various correspondents engaged in the iron manufacture in different parts of Pennsylvania, Virginia, and Ohio, requesting information respecting the removal of sulphur from coal in making coke. We remember the tenor of one received about three years since, which ran thus:—"Do you know any method of removing the sulphur from coal in the manufacture of coke, which I use in smelting my iron? I believe it is the principal cause of making inferior iron, and if it were entirely removed a very improved quality would be the result." We could not then give him the desired information, but now we have something to say on this very point. At the late meeting of the British Association of Science, Prof. Calvert read a paper on the iron manufacture, in which he stated that by mixing about half a bushel of common salt with every tun of coal in the coke-oven the coke so made gave off no sulphurous fumes, and when used in a cupola in smelting, it produced iron much closer in grain, and 20 per cent. stronger than that made from common coke. This coke was also superior for locomotive use. This information may be of importance to some of our iron manufacturers, who might also try the effects of salt in their blast furnaces, as Prof. Calvert stated, that when thus used it improved the iron, though not to such a degree as by using the purified coke.

Hints on the Value of Patents.

We are informed that a sale of a portion of the right to *Wood's Patent Shingle Machine* has lately been made at Albany, N. Y., for the sum of $35,000. It is a good invention, and the purchasers will probably quadruple their investment in a short time.

It is understood that the Messrs. Jerome, of New Haven, Conn., the celebrated clock makers, have recently purchased a portion of the right to *Robertson's patent Sewing Machine* for the sum of $30,000. This sewing machine is said to be a remarkable novelty. In size it is scarcely larger than the little sewing birds used by the ladies, and may easily be carried in the pocket. In external appearance it is highly ornamental. Its construction is so simple that a child of five years can operate it with success. For the use of families and individuals the invention appears to be admirable. We are told that a seampstress with the aid of one of these machines, will be able to do in one day the ordinary hand labor of an entire week. The Messrs. Jerome are at present engaged in constructing machinery for the manufacture of this improvement on a large scale, and in January next will be ready to fill orders. Retail price of the machine, $10. The best sewing machines of the other makers cost from $100 to $140.

Speaking of sewing machines reminds us of the profit on *Howe's Patent.* The income of this inventor from licenses to use his shuttle, is said to be over $50,000 a year. *Messrs. Singer & Co.* are said to be making money at the rate of $75,000 a year from their sewing machines. The *Wheeler and Wilson Sewing Machine Co.* are understood to make $30,000 per annum. We might speak of a number of other very successful inventors and manufacturers in this line of business, but it is unnecessary.

Rights for *Sandford's Patent Hand Corn Planter*, we are informed, have been sold to the amount of $30,000. *Wakefield's Patent Hand Corn Planter* has been sold for a still larger sum; a single manufacturer of this invention at New Haven, Conn., is said to have realized a profit on the same of $40,000 during the past year.

Wm. Mount Storms' Patent Cloud Engine is reported to have been sold to a company of wealthy gentlemen in this city. Capital stock paid in, $500,000, of which a large proportion was received by the inventor.

D. W. Clark, of Bridgeport, Conn., is understood to have received $30,000 for his *Patent Pump.*

One half of a certain patent *Curtain Fixture* contrivance, which permits the curtain to be raised or lowered from the top, is said to have sold for $4,000.

A small portion of the right to Smith & Fenwick's *Patent Apple Paring Machine* lately brought $2,000.

Creamer's Patent Car Brake is said to have been purchased by a company for $250,000.

A single right to use *Winter's Patent Wood Sawing Machine* has been sold to a certain railroad company in this vicinity, we are told, for $2,000.

A single right to use *Kitson's Patent Cotton Picker*, sold to a certain factory, brought the inventor, if our information is correct, the sum of $2,300.

We could fill our paper with facts like the above, if we were to take time for their collection. They are of use and interest as illustrating the value of all kinds of patent property; they are likewise encouraging and stimulating to inventors. It is chiefly for this latter reason that we have presented them. At the present moment we think of no class of individuals who enjoy such golden opportunities of success as those whom Providence has favored with a genius for mechanics. We are not surprised that this country so abounds with new inventions; the only wonder is, that there are not ten patents where one now exists. The demand is far greater than the supply.

The long evenings of winter present ample time for thought, and should be constantly improved. Those who have tried to invent, but failed, should try again. If effort be earnest and continued, the light will at last break through.

Persons who invent, or become interested in inventions should remember one thing: no discovery is of much pecuniary value in this country *until it is patented.* The first step, therefore, after an invention has been thought out, is to secure its advantages, by law, as soon as possible. A neglect of this simple duty has, in many instances, been the means of dashing from the lips of the inventor, the cup of happiness which he was about to quaff. It is an old maxim that tells us "Delays are dangerous." In regard to the obtaining of patents this is emphatically true.

Woodworth Patent Remonstrances.

At the request of several of our subscribers, we have had printed a large number of petitions against the extension of the Woodworth Patent, which we are anxious to have distributed as soon as possible. They ought now to be put in active circulation for signatures: let this be done without delay, and there is not much fear of the result. Upon the receipt of two three-cent postage stamps, we will forward a petition and pre-pay the postage.

Send in your orders as fast as possible.

Australian Expedition.

An expedition has been fitted out in Australia to explore the Victoria river. The party is composed of eighteen persons, and will be absent three years. It is believed they will bring back much to add to the treasury of natural and geological knowledge.

The factory of Mr. Kellog, in Skeneateles, N. Y. is lighted with the Benzole light.

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British Association for the Advancement of Science.—No. 3.

BINOCULAR VISION—Sir David Brewster read a paper on this subject. Prof. Dove had published an account of some beautiful experiments in connection with this subject some years ago, and showed in his paper that when different colors at the same real distance are regarded by the eye they appear to be at different distances; this is also the case when a white surface is compared with a black. Now M. Dove argues if a white surface and a black one be stereoscopically combined, one of them must be seen through the other. Taking a figure for the left eye with a white ground, and a second figure of the same object on a black ground for the right eye, when these two figures are combined, a beautiful effect is observed; the figure starts into a relief, and its sides appear to possess a shining metallic luster. This is the case when the surface of each single object is quite dull and lusterless. On this experiment M. Dove founds a theory of luster, supposing it to be produced by the action of light received from surfaces at different distances from the eye. An example of this is the effect observed on looking at varnished pictures; one portion of the light comes from the anterior surface of the varnish, and the other from its posterior surface, the action of both of these conspiring to produce the observed luster. The metallic luster of mica is also referred to by M. Dove as an example of the same kind. In his communication Sir David Brewster controverted the theory here laid down, and based his objections on the following remarkable experiment:—where a white sur face without definite boundary, and a black surface of the same kind, are regarded through the stereoscope no luster is observed. Sir David therefore infers that the luster is due not to the rays from one surface passing through the other to the eye, but to the effort of the eyes to combine the two stereoscopic pictures.

CURIOUS MOTIONS ON THE SURFACES OF ALCOHOLIC LIQUORS—A paper on this subject was read by J. Thomson. The phenomena of capilliary attraction in liquids are accounted for according to the generally received theory of Dr. Young, by the existence of forces equivalent to a tension of the surface of the liquid, uniform in all directions, and independent of the form of the surface. The tensile force is not the same in different liquids. Thus it is much less in alcohol than in water. This fact affords an explanation of several very curious motions observable, under various cir cumstances, at the surfaces of alcoholic liquors. One part of these phenomena is, that if, in the middle of the surface of a glass of water, a small quantity of alcohol, or strong spirituous liquor, be gently introduced, a rapid rushing of the surface is found to occcur outwards from the place where the spirit is introduced Another part of the phenomena is, that if the sides of the vessel be wet with water above the general level surface of the water, and if the spirit be introduced in sufficient quantity in the middle of the vessel, or if it be introduced near the side, the fluid is even seen to ascend the inside of the glass until it accumulates in some places to such an extent that its weight preponderates, and it falls down again. The manner in which Mr. Thomson explains these two parts of the phenomena is, that the more watery portions of the entire surface, having more tension than those which are more alcoholic, drag the latter briskly away, sometimes even so as to form a horizontal ring of liquid high up round the interior of the vessel, and thicker than that by which the interior of the vessel was wet. Then the tendency is for the various parts of this ring or line to run together to those parts which happen to be most watery, so that there is no staple equilibrium, for the parts to which the various portions of the liquid aggregate themselves they become too heavy to be sustained, and so fall down. On this matter Mr. Thomson exhibited a very decisive experiment by pouring water on a flat silver tray, previously carefully cleaned from any film which could hinder the water from thoroughly wetting the surface The water was about one-tenth of an inch deep. Then, on a little alcohol being laid down in the middle of the tray, the water immediately rushed away from the middle, leaving a deep hollow there, which laid the tray bare of all liquid, except an exceedingly thin film.—These and other experiments, which he made with fine lvcopodium powder dusted on the surface of the water, into the middle of which he introduced alcohol gently from a fine tube, were very simple, and can easily be repeated. Certain curious return currents which he showed by means of the powder on the surface, he stated had not yet been able fully to explain.

ON THE ANCIENT STONE WRITINGS OF THE BABYLONIANS AND ASSYRIANS—The following is an abstract of an interesting discourse before the Association on the above subject, by the celebrated Col. Rawlinson:—

"Col. Rawlinson began by saying he feared the vastness, as well as to a great extent the novelty, of the subject would prevent him doing it anything like justice in the very limited time he had at his disposal. The excavations which had been carried on in Assyria and Babylonia had been continued through six or seven years—they had ranged over tracts of country one thousand miles in extent—the marbles excavated would be sufficient to load three or four ships, and the historical information contained in them would exceed ten thousand volumes in clay. Of course, in dealing with such a subject he could only select a portion of it—and even of that he could only communicate the heads. The part to which he wished to direct their attention was the Cuneiform Inscriptions. This phrase merely signified the wedge-shaped form of writing, and was not employed in any particular language or by one particular nation. The cuneiform system of letters was a species of picture writing, invented, not by the Semitic inhabitants of Babylon, but by those who preceded them. This writing was, however, reduced by the Semitic race to letters, and adapted to the articulation of their language. Their mode of writing consisted of several elements—the picture-writing, and the phonetic, which was equivalent to the alphabet of their language. He had been able to obtain among the ruins of Nineveh a tablet which actually exhibited the several developements of this system of writing into a regular alphabet. The cuneiform inscriptions were divided into three branches—Persian, Scythic, and Assyrian—and it was on the third of these that he wished to say a few words. About twenty years ago his attention hrd been directed to a series of inscriptions in cuneiform characters on a rock at Behistun, near Kermaixhah. The tablet was divided into three compartments, giving three different versions of the same inscription, and on the simplest of these, the Persian, he set to work, and found, by comparing it with the two others that they corresponded, with the exception two or three groups, from which, on further investigation, he made out Hystaspes, Darius, and Xerxes. By means of these proper names he obtained an insight into the Persian alphabet, and by analyzing the names of the ancestors of Darius and Hystaspes, and obtaining a list of the tributary provinces of Persia, he managed to form the alphabet. This was, however, but the first step; the great object being to decipher the Assyrian inscription, and this could only be done by comparing it with the Persian. The tablet was situated on the face of the rock, five hundred feet from the ground, with a precipice above it of one thousand two hundred feet, and in order to reach it it was necessary to stand on the top rung of a ladder, placed almost perpendicular. Nor was this all, for there was still the Babylonian to be copied, and it was engraved on the overhanging ledge of rock, which there was no means of reaching but by fastening tent-pegs into the rock, hanging a rope from one to the other, and while thus swinging in mid-air, copying the inscription. An insight into the system of writing being thus obtained, the fortunate discovery of the ruins of Ninevah furnished a great mass of documents to which it might be applied. Wherever they had found tumuli, or any appearance of a ruin, trenches were sunk, galleries opened, and in almost every case they came upon the remains of inscribed tablets. The decipherment of these inscriptions led to important results in an ethnological point of view, both as indicating the race to which the writers belonged, and affording important information with reference to the habitat of races and their migrations.—Among the many points which they were now enabled satisfactorily to settle, he alluded to the connection between the Turanian and Hamic families, and to the occupation of Western Asia by the Scythic, and not the Semitic race. He also mentioned that from the inscriptions he believed it could be shown that the Queen of Sheba came from Idumea. An erroneous impression was at one time in circulation that the information obtained from the inscriptions was adverse to Scripture. But so much was it the reverse of this, that if they were to draw up a scheme of chronology from the inscriptions without having seen the statements of the Scriptures, they would find it coincide on every important point. He then mentioned some circumstances with reference to the mound at Birs-Nimroud, which he had recently uncovered, and which he found laid out in the form of seven terraces. These were arranged in the order in which the Chaldeans or Sabeans supposed the planetary spheres were arranged, and each terrace being painted in different colors, in order to represent its respective planet. He also mentioned a small ivory cylinder which he had discovered, and round which were engraved mathematical figures, so small that they could hardly be seen with the naked eye, and which could not have been engraved without the aid of a very strong lens. In concluding, he said that before the British Association met next year, he hoped to be able to bring before them the decipherment of several highly important inscriptions.

Gratitude to Improvers of the Iron Manufactures.

The city of Newark, N. J., is celebrated for various kinds of manufactures, such as jewelry, carriage-making, patent leather, and malleable iron castings. A number of companies are engaged in the two latter kinds of manufactures; they employ a great number of persons, and the fame of their productions is coextensive with our country's commerce. The *Tribune* of the 4th inst. contains a very interesting article on the subject, and attributes—justly we have been informed—the introduction of both of these manufactures to Seth Boyden, an ingenious and enterprising Massachusetts mechanic, who took up his abode in Newark about thirty years ago. At that time an endless variety of small iron articles now made of cast-iron, were fabricated by forging them of wrought-iron, from the fact that common cast-iron is exceedingly brittle, and does not possess the quality of toughness. The discovery of rendering cast-iron tough by what is termed malleablizing, was one of the most important inventions ever made. It was well-known in England before it was in our country, but was kept a profound secret. In 1825 some malleable iron castings having been imported from England by David Beach, of Newark, they arrested the attention of Seth Boyden, and he immediately commenced experiments to discover the process; and he labored for years, until success crowned his enterprise and efforts. The process of malleablizing or rendering cast-iron tough, consists in submitting common articles of cast-iron to a high heat, for several days, in an iron box, separated from one another by iron filings, and then allowing them to cool very slowly. Soon after Seth Boyden discovered how to render cast iron tough, he erected a foundry in Newark, in company with some others, and commenced business. At that time malleable iron castings sold readily for 30 cents per pound; their price now ranges from nine to sixteen cents. Instead of only one small foundry doing the whole malleable iron business in our country as in 1827, there are now seven different establishments in Newark alone, whose sales amount to $375,000 per annum, and there are various like foundries in other different cities. And how has Seth Boyden been rewarded for his discovery, and the valuable contribution which he has made to the solid wealth and industrial progress of our country? The *Tribune* says he is now working as a journeyman in a Newark machine shop. It is stated that he had made considerable money, but he never loved it for its own sake; his desire has been to elaborate useful ideas for the good of the community, and so when he has made money by one useful discovery or in the way of business, he has been impelled by a restless desire to use it in making experiments to discover new improvements. Such men as Seth Boyden are public benefactors, they do more for the material prosperity of their country than the most renowned orators or statemen. We hope that Seth Boyden will never know the approach of penury. If the citizens of Newark ever allow this to be the case, they will never escape the obliquy of ingratitude.

Republics have been accused for pre-eminence in ingratitude, but are monarchial governments stainless in this respect? Let us take a case and try it. The greatest improvements ever made in the manufacturing of wrought bar iron were invented by Henry Cort, a native of Lancaster, England. In the years 1783 and 1784 he obtained two patents; one rendering cast iron malleable in a reverberatory furnace heated by the flame of coal to avoid the impurities of the fuel mixing with the metal in a fluid state—the process called *puddling*. The other invention was the manufacture of bar iron, by passing the puddled iron in *blooms*, through fluted or grooved rollers. These two inventions are now used in the manufacture of bar iron in every civilized country under the sun. All nations are his debtors; the benefits conferred upon them by his inventions are beyond calculation. His improvements have reduced the cost of making bar iron 66 per cent., and have been the means of saving, to Great Britain alone, no less, it is calculated, than £300,000,000 sterling in sixty years, and have raised that country from being an importer of iron from Russia, America, and other countries, to be the greatest iron manufacturer and exporter in the world. And how was Henry Cort rewarded for his inventions by a grateful monarchy? In making his experiments he expended a private fortune of more than $100,000, and when he had them perfected he was obliged to take into partnership another person who could furnish some capital to carry on the business. His partner was a deputy of the British Navy, who saw at once the value of the improvements, and invested £27,000—about $115,000, which he privily applied from the public funds entrusted to his care. He soon afterwards died, and when his accounts were examined, it was found he was a public defaulter. His effects were then seized by the government, and with them the two patents of Henry Cort, whose business was destroyed, and from this blow he never recovered, and a few years afterwards he died a ruined and broken-hearted man. It is indeed true that when reduced to poverty in 1794, upon the representations of several bankers and merchants in London, Wm. Pitt obtained a pension for him of $1000 per annum, which he received for only six years, his death having occurred in 1800.

How boundless was this generosity of the British Government and the British public to this inventor. Just think of the paltry sum of one thousand dollars per annum, doled out to him, when his inventions were saving to the public of more than £10,000,000 per annum and in 1853 no less than £65,000,000 sterling. And for this great public benefit the British Government paid him altogether twelve hundred pounds—about six thousand dollars—while he himself had spent a private fortune of $100,000 in perfecting his invention. Oh what ingratitude. Can any Republic be more ungrateful; has any Republic ever exhibited so much ingratitude? We think not. Do not let the British public throw the blame of such ingratitude upon their government; they hold the public purse strings, and the blame must rest on them. One of Henry Cort's sons and three daughters, each over seventy years of age, we understand, are now living in indigent circumstances in England, while, the nation has grown rich on their father's discoveries. If the Monarchy desires to show its gratitude, here are worthy objects for its display. May such charges never have to be made against our own country.

A Great Traveler.

The celebrated Dr. Barth, the German traveler, who has recently returned from Africa to Europe, traveled 12.000 miles in that strange and pestilential part of the globe. His explorations of Central Africa rank as high, and are just as important, as the contributions of Cook to the geography of the Pacific, and those of Humboldt to the knowledge of America.

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TO CORRESPONDENTS.

H. H., of England—We have examined the drawing of your alleged improvement in street sweeping machinery. We regret to inform you that it does not embrace anything upon which a patent can be secured. In Vol. 3 of the SCI. AM. we published an engraving of a machine almost identically like yours. It has never been brought into successful use here, therefore we conclude that it is incapable of performing as well as more modern contrivances for the purpose. The fact of your having taken a patent at home will not aid you in procuring one here.—The invention must stand upon its novelty, and unless it possesses this necessary quality the application would be rejected. You could not assign your right to an American citizen, and thus avoid paying $500 as patent fee.—Your views in regard to this fee required of an English subject are perfectly correct, and we are ashamed of our government for allowing this disgraceful feature of our patent system to exist. We hope it will be wiped out this winter.

R. R., of Pa.—We are very glad to hear that you are intending to work against the Woodworth Patent extension this winter. There is no doubt whatever that attempts will be made to get it extended. Its owners will struggle so long as there is the smallest gleam of hope, and will hang on like a dog to a root. Their efforts must be defeated by public opinion, freely and frankly expressed. No under-handed nor unfair course need be pursued. We condemn every thing of the sort; there is no necessity for it. Remonstrances will effect the object if care be taken to get them signed by those who are honestly opposed to the extension. We hope our friends generally will see to it that petitions are freely circulated for signatures.

W. T. G., of Ind.—Your letter covering $25 to pay for three months' insertion of the advertisement referred to, came duly to hand.

T. S., of Pa.—Your apparatus is the same as Savery's engine patented in England in 1393. This was the first application of steam to the raising of water of which there is any published account. You will find it in Dr. Lardner's, or almost any other history of the steam engine.

L. E. O. C., of N. Y.—We understand you to mean the use of a spiral wheel instead of a scroll, if so, the plan is neither new nor patentable.

T. H., of Ohio—We find nothing new in your water meter.

J. H., of Pa.—Your perpetual motion device contains all the elements of success that we have ever seen, or expect to see, in such contrivances. When you can put a gear wheel on the North Pole, and connect with it a main shaft running down to this part of the world, you can have perpetual motion, but not sooner.

W. W. D., of ——Making the end of the nozzle of a hose pipe with lips like a tea kettle, would not, we think, be patentable.

J. H., of Tenn.—The surveying instrument you describe is not new.

D. B. T., of Ohio—Making car axles of bundles of wrought-iron rods is not new. Your particular way of combining them would perhaps be patentable; but we fear that a fortune could not be made from the grant.

J. R. H., of Ohio—Address J. D. Johnson, Bridgeport, Ct., for shingle machine. $1 received.

C. S. P., of Pa.—Address the Goodyear Rubber Co., New York, for rubber. $1 received.

E. R., of Md.—The sails of a windmill should have an inclination of fifteen degrees.

H. H. R., of Ct.—We have carefully examined the sketch and description of your apparatus for the treatment of inflected spine, by balancing a frame on gudgeons and supports, upon which the patient is secured. We find by reference to the list of patents that an invention almost precisely like yours was patented in 1829, by J. K. Casey, of this city. The editor of the *Franklin Journal* commended it very warmly in an article published about the time the patent was issued. Nothing has since been heard of it that we are aware of. There is therefore no chance for you to get a patent on yours.

G. A. W., of Me.—Your plan of floating valuables in case of the sinking of a ship, is useful, but it is old and not patentable.

A. K. S., of Pa.—The change in your model is approved.

W. C. T., of Vt.—There is just a chance for a patent on your metal cutting machine and that is all we can say.

C. G., of Texas—Probably so: $2 you can get a violin instructor. Address W. Hall & Son, N. Y.

W. M., of Md.—We are not acquainted with the engine you refer to.

G. R., of Ohio—A steam engine of three or four horse powers will drive your small planer. To drive your planer, two circular saws, a tenoning machine, an upright saw and lathe you ought to have no less than a twelve horse power engine. A six horse engine might answer your purpose, by running two or three of your machines at once, as in all likelihood, from the nature of your business, you may not have constant work for the tenoning machine and the saws at the same.

W. R., of N. Y.—Your yellow powder is a suboxyd of mercury; you will find it described on page 785. Booth and Morfit's Encyclopedia of Chemistry.

A. H. N., of Mo.—With a blower you can use the coal on your farm under your boilers without any difficulty. Don't throw down your brick chimney to put up an iron one, as the brick is the best. If you make the throat of your chimney of the same area as the flues of your boiler, you cannot go wrong. There is actually no positive rule for the hight of a chimney. The higher you build it the better will be the draft. If you put one up eighty feet high, it should give you plenty of draft.

N. B., of ——.—We think a patent might be secured upon your piston packing. You failed to give your address.

A. D. S., of Me.—We are not able to refer you to any one who makes portable apparatus for roasting and grinding coffee. We presume any warehouse that keeps household articles articles could supply you.

W. H. D. Galliagd, Pendleton, S. C.—wishes to procure a lathe for turning spokes.

H. S., of N. Y.—Merely galvanizing wire for screens could not be patented; there must be some new process for doing this. If you merely use the commonly understood process then you could not secure a patent for it.

J. T. Clarke, of Blairsville, Pa.—Wishes to obtain the most approved hub boring and mortising machine.

M. B. Tidey, of Dundee, N. Y.—Wishes to procure the best spoke tenoning machine in use. We do not know where a copy of the list of patents published in 1847 can be obtained. It does not contain the claims. These can be found in the Patent Office Reports, issued yearly, and also in the SCI. AM.

G. A. W., of Me.—Several good devices have been patented, which will successfully feed blank paper to the printing press. The trouble is in printing both sides. The sheet does not issue quite straight from the press, and, as yet, no feeding apparatus has been made that feeds the sheets correctly when they are unevenly laid together.—The feeding first for the impression is easily done by mechanism, as the sheets are all evenly laid; the difficulty is to feed for the second impression.

D. N. D., of Mass.—The sketch of your straw cutter has been examined. The employment of two series of circular knives whose edges pass each other in the manner shown in your plan is not a new invention. We have seen the same thing on exhibition at one of the late Fairs of the American Institute.

J. D. H., of Ill.—In Vol. 6, SCI. AM., we published a series of articles upon water wheels, which you will find very useful. The Volume can be had bound for $2,75. You can find Herbert's Encyclopedia in any well-selected public library. We do not think it can be had at book stores.

S. J. W., of Mich.—There is nothing patentable in your invention, unless it be the mere arrangement of parts.—There are several methods already in use of heating air by the exhaust steam, to supply the fire, to the exclusion of the cold atmosphere, and it has been proposed to employ the waste heat to heat air as a motive power, but the expansive force imparted by the air would be so small that it never would compensate for the additional machinery.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, Dec. 8, 1855:—

T. R., of N. Y., $15; G. & Co., of O., $250; J. C. P., of O., $25; I. C., of N. Y., $25; C. P., of Mich., $25; J. E. C., of Mass., $55; S. I. C., of S. C., $25; J. W., of Mich., $10; A. M. G., of N. Y., $25; W. & D., of N. Y., $30; S. & B., of Mich., $30; E. V. P., of N. Y., $250; S. & H., of N. Y., $250; T. D., Jr., of Pa., $25; J. E., of R. I., $25; A. T., of N. Y., $30; T. C. H., of N. Y., $30; J. R. H. of N. J., $25; J. E. H., of Tex., $25; A. S. B., of Mass., $30; J. A. A., of N. Y., $30; G. C. H., of Mass., $30; M. M., of La., $55; O. L. R., of N. H., $30; J. J. J., of Mass., $30; M. F., of N. Y., $25; D. W. C., of Conn., $250; B. J. R., of N. Y., $10; H. B. S., of Vt., $30; J. V. W., of N. Y., $30; D. E. H., of N. Y., $25; R. E., of N. Y., $25; R. B., of N. Y., $25; C. E. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 8:—

J. E. C., of Mass.; A. B. S., of Pa.; I. C., of N. Y.; J. L. & Co., of Ill.; C. P., of Mich.; J. E. H., of Tex.; S. I. C., of S. C.; A. M. G., of N. Y.; T. D., Jr., of Pa.; J. E., of R. I.; J. R. H., of N. J.; D. E. H., of N. Y.; A. S. B., of Mass.; P. C. G., of O.; A. H. C., of O.; R. E., of N. Y.; S. & B., of Mich. (3 cases); R. B., of N. Y.; C. E. B., of N. Y.; J. J. J., of Mass.; J. H., of O.

Important Items.

GOING RAPIDLY—The back numbers of the present volume are fast being exhausted, and those who desire the numbers of Vol. 11 complete, must not wait much longer before remitting their subscriptions, else they will be disappointed.

MODELS—We shall esteem it a great favor if inventor will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

Subscribers or exchanges who are entitled, to the paper and fail to receive it regularly are desired to inform us that any omission may be corrected. Missing numbers are furnished gratuitously where the fault rests with the publishers.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and enclosing $1 as fees for copying.

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THE SUBSCRIBER having had a considerable experience in the sale of Patent Rights, will take the agency for the sale of some valuable improvements in this State and Michigan, and as I am engaged in the manufacture of Agricultural Implements, such will suit me best. Satisfactory references can be given.
A. WILBUR,
1* Ontario, Lagrange Co., Ind.

PROF. ROBERT HARE'S Great Book—with engravings illustrating the Dr's, ingenious mechanical inventions to detect deception, and scientifically demonstrate the true agent involved in the so-called spiritual manifestations. Price $1,75, postage 25 cents, just published by PARTRIDGE & BRITTAN, fronting the Tabernacle, No. 342 Broadway, N. Y. 14 2*

RAILROAD SHUTTERS FOR STORES—An improvement in the above line was patented August 23th, 1855. Those wishing to use this improvement can be accommodated on reasonable terms by applying to the patentee and manufacturer, D. ROHAN, No. 7 Jackson st., Cincinnati. Ohio. 14 4*

$500 TO $10,000—GREAT INVESTMENT.—Any person desirous of investing a large or small amount in a patent right, that the profits of which will clear the whole cost in one month's sales. Can find an opportunity by addressing Box 2,627 this city. 14 4*

IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had TEN years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

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FOR SALE—G. W. Bishup's Patent Marble Spire Sawing Machine.—This machine will cut two sides of any taper, or straight, as desired. State, county or shop rights for sale. The above device is simple, and with as little friction as any before the public. All letters addressed to G. W. BISHUP, 25 Debevoise St., Brooklyn, N. Y., will meet with due attention. 1*

1855-6.—WOODWORTH'S PATENT Planing, Tonguing and Grooving Machines.—The subscriber is constantly manufacturing, and has now for sale the best assortment of the saunrivalled machines to be found in the United States. Prices from $35 to $1150. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 14 3m*

IMPORTANT INVENTION—Patented August 14th, 1855. "Garratt's Metal" for Journal Boxes of all kinds. It is anti-friction, absorbs the oil, not liable to break, it can be made cheaper than either brass or Babbitt metal, and after many long and severe tests, has been found to surpass all other metals ever used for the purpose. For the purchase of either State, county, or shop rights under this patent, apply to JOS. GARRATT, Senr., Madison, Indiana. 13 3m*

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CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects: they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places, the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston.
12 3m* WELCH & GRIFFITHS.

BARNEY'S PATENT WHIFFLETREE for detaching horses from vehicles in an instant of time, should they attempt to run or become otherwise unmanageable. Rights for States, counties, cities, or towns for sale very low. Persons wishing to purchase will please address, GEO. C. BARNEY, Patentee, 15 Kilby St., Boston. 11 4*

STATIONARY STEAM ENINES FOR SALE—Horizontal Engines with iron bed frames, and Judson's Patent Valves, good, strong, substantial, plain finish, ed, that will do good service, say from 4 horse power, $215 to 30 horse power, $1,037. Pumps, Boilers, and fixtures can also be supplied when needed. Address
2e3wtf S. C. HILLS, 12 Platt st., New York.

CIRCULAR SAW MILLS (Wells' Patent) Double and Single, of various dimensions, adapted to sawing logs of all sizes to 4 1-2 feet diameter; admitted the most efficient, durable, and convenient machines in the country for manufacturing lumber. Orders promptly filled and mills forwarded to any part of the United States, warranted to give entire satisfaction. Address H. WELLS & CO., Florence, Hampshire Co., Mass. 10 6eow*

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description, Broker in steam vessel, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic self-adjusting Conical Packing, Faber's Water Guage, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, Machinery Oil of the most approved kind, etc.
CHARLES W. COPELAND,
43 eowtf Consulting Engineer, 64 Broadway.

THE ARTISAN JOURNAL.—A Monthly Record of the progress of Civil and Mechanical Engineering, Steam Navigation, Shipbuilding, and the Industrial Arts, Chemistry, &c. Published in London, and for sale in numbers and volumes by CHAS. H. HASWELL, Consulting and Superintending Engineer, 4 Bowling Green, New York. Drawings and specifications of Steam Machinery, in all its branches, furnished upon application. 41 1am

DYOTT'S PATENT IRON FRONT.—Dyott's Patent Furnace; Ludwig's Patent Machine for Felling Trees; (refer to SCI. AM., Sept. 8, 1855, No. 52,) Harrison's Patent Grain Mills. For all the above, information can be had of GEO. C. BARNEY, Agent, 15 Kilby St., Boston. 11 4*

NOTICE TO PLOW MANUFACTURERS.—JOSHUA GIBBS, of Canton, O., has invented a machine for Grinding and Polishing plows. By addressing the patentee, a cut and directions for making and using will be forwarded, also the term of three months will be granted to test its utility and advantages. Cost for erecting the machine will not exceed $15. 12 8*

S. D. BARNETT, Malleable and Gray Iron Works Hamilton, corner McWhorter street, Newark, N J. Orders promptly attended to. 9 10*

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VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch.
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INCRUSTATION OF BOILERS—Weissenborn's Patent Incrustation Preventor effectually obviates incrustation, by separating the incrusting matter from the water before it enters the boiler, while at the same time it is of great value as a heater and condenser. The apparatus occupies but little space, is simple in construction and management, and applicable alike to stationary, locomotive, and marine engines. Testimony can be furnished of its successful operation for several months, during which it has been in use here, and for two years in Europe, with water containing an unusual proportion of lime. Drawings and full descriptions will be furnished to parties desiring them. For right to use this invention apply to E. W. SARGENT, Delmonico's Hotel, No. 25 Broadway, New York. 10 5*

MACHINISTS' TOOLS.—Meriden Machine Co have on hand at their New York Office, 15 Gold street, a great variety of Machinists' Tools, Hand and Power Punching Presses, Forcing Pumps, Machine Belting, &c., all of the best quality. Factory West Meriden, Conn. 2 13*

W. P. N. FITZGERALD, Counsellor at Law—late Principal Examiner in the U. S. Patent Office—has removed from Washington, D. C. to the city of New York, 271 Broadway, (corner of Chambers St.) As heretofore, his practice is confined to Patent Cases, which he will prosecute or defend, as counsel, before the Supreme and Circuit Courts of the United States, also before the Patent Office, or the Judges having jurisdiction of appeals therefrom. 11tf

WATER POWER FOR SALE—8 hours' ride from the city of New York, near the beautiful and thriving village of Owego, on the New York and Erie Railroad. The wheel is 14 feet diameter, 5 foot bucket, building 75 by 25, two stories high. For particulars apply to HARVEY CHURCH, Troy, N. Y., or H. H. NASH, Owego, N. Y. 8 8*

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IMPORTANT TO ENGINEERS AND MACHINISTS—NOTICE—Those wishing to obtain the genuine articles of Metallic Oil and Grease, should send their orders direct to the manufacturer, AUGUSTUS YOCKNEY, Office 67 Exchange Place, New York. No Agents employed. 1 6m*

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Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.
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THE EUROPEAN MINING JOURNAL, RAILway and Commercial Gazette. A weekly newspaper, forming a complete history of the Commercial and Scientific Progress of Mines and Railways, and a carefully collated Synopsis, with numerous Illustrations, of all New Inventions and Improvements in Mechanics and Civil Engineering. Office 26 Fleet street, London. Price $6,50 per annum. 36 tf

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Science and Art.

Another New Metal.

A recent number of the *Siecle* (Paris,) under the head of "Transmutation," publishes an article upon the new discovery of turning paving stones into a substitute for silver, by M. Plee. He starts from the necessity of producing an equilibrium between the two metals, gold and silver, and says that such an equilibrium, wanting totally at the present moment, since the influx of gold from California and Australia, is of the utmost importance for trade; and remarks that the advanced state of science will assuredly not leave us in the impossibility of supplying the void left by the insufficient yield of silver; and that we shall end either by extracting silver elsewhere than from the silver mines, or by discovering new metals to take its place. "There are, for instance," he observes "new metals noble and beautiful as the old ones, hitherto held to be not reducible, which are now perfectly reduced, and which, for the fabrication of every object till now fabricated in silver, would be a complete equivalent for it, and thus allow it to be exclusively consecrated to the monetary circulation." M. Plee follows up his assertion by the ensuing details :-" Take a thick lump of quartzose silex, reduce it to powder, mix this silex, when pulverized, with a sufficient quantity of alkali, fuse it, and you will obtain a soluble glass that you can dissolve so as to precipitate the silex it contains in the shape of a jelly. You then take this last product and have it filtered, then re-dissolved a second time in a cyanurated lixivium, so as to produce a compound cyanuret.—This operation will give you a fluid from which to extract the metal called silicium. Plunge into this liquid your utensils, whether of copper, zinc, tin, or lead, bring the electric process to bear upon them properly, and they will instantly be covered with the adherent plating of silicium, which is white as silver, and attains to the highest degree of luster under the polisher's hand." M. Charles Junot is the inventor of this new metal, and he has, according to the account given by M. Plee, spent years in indefatigable research; nor does the silicium appear to be the only substitute for silver he has discovered. Two or three others are equally mentioned by M. Plee. The silicium, however, seems to be so difficult to distinguish from silver, that a learned French chemist has already presented to the Academy of Sciences a report on the necessity of devising fresh methods of analysis, in order to distinguish between the two metals. "Other chemists," he adds, "have other processes for the reduction of silicium, and all are setting to work at it. It is, therefore, to be expected that a complete transmutation will be effected. We shall from clay draw aluminum; from freestone, silex, and from sand, we shall extract silicium; these metals, given up to industry and fabrication, may replace silver for domestic purposes, and silver be thus entirely restored to monetary circulation."

The basis of silicon has been known to be a metal for a long time, but we have never heard of it being obtained pure before. It may therefore be called a new metal, with great propriety. We are of opinion that it may yet be obtained at a lower cost than silver, but this will all depend on the discovery of improved processes for its cheap reduction from its ore, which is one of the most plentiful on our globe.

Chemical Technology.

H. Bailliere, No. 290 Broadway, this city, has just issued Vol. 1 of "Chemistry Applied to the Arts and Manufactures," by Dr. E. Ronalds and Dr. Thomas Richardson.

We have much pleasure in bringing before the notice of the public this new edition of the first volume of Knapp's Chemistry. As the authors say in their preface: "during the few years which have elapsed since the publication of the first volume of our edition of Knapp, so rapid has been the growth, and so great the developement of those branches of manufacture more intimately connected with fuel, that, in preparing a second edition, we have found it necessary to re-write much of the original, so that it may with far greater propriety be called a new work rather than a second edition. The elaborate researches undertaken at the instigation of the governments of the United States and England into the chemical nature of coal, more particularly with reference to its adaptation to the generation of steam, and the recent legislative measures towards the prevention of smoke in large cities, have invested this subject with unusual interest."

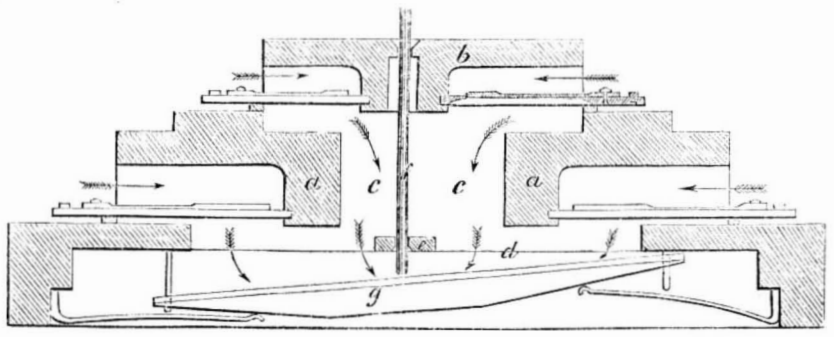
A peculiar feature in this work is the arrangement of the subjects into groups, comprising those branches of manufacture which are dependent upon each other, and necessarily connected in a commercial point of view. Thus, among the products obtained from dry distillation of fuel, will be found an account of the manufacture of pyroligneous acid and its salts, of ammonia and its salts, of coal-tar naphtha, paraffine, etc., etc.

The first chapter is "Observations on the nature and properties of Fuel," followed by an article "On the effect of Heat upon Fuel," in the production of charcoal, coke, waste gases, etc., etc. "The application of Fuel to the production of Heat," for warming dwellings, &c. The latest inventions of stoves, grates, hot-water apparatus, furnaces, &c., are illustrated with excellent wood cuts.

Three hundred pages are devoted to "The application of Fuel to the production of Light." This is one of the most important parts of the book, and is most extensively illustrated. The subjects treated are fats, oils, tallows, wax, gas, &c., &c., with their most approved modes of manufacture, and the different lamps, &c., in which they are used. The article on safety lamps is the most complete ever written, and contains forty-five delineations. Much useful information may be obtained from the statistical tables, and the tables of the relative value of the different kinds of coal found in Europe and America.

The authors, aided by several of the scientific men of England, have added a chapter on the subject, "What is Coal?" on the reply to which important interests depended, in the recent cause of Gillespie vs. Russell, in Scotland, and Gesner vs. Cairn, in New Brunswick. Two colored plates of the microscopic examination of the Nova Scotia, Allenheads, Bovey, German, and other coals, are inserted.

MELODEONS---HUNT'S PATENT IMPROVEMENT.



This engraving represents a vertical transverse section through the reed-board of a melodeon illustrating the improvement for which a patent was granted to George G. Hunt, of Wolcotville, Conn., on the 23d of October last.

The nature of the improvement consists in such construction of the "reed-board" that two, four, or even more sets of reeds may be added to the usual instrument, thereby increasing the quantity of tone or the fullness of the chords, or both, without requiring an additional rank of keys, and with but slight, if any addition to the heaviness of touch necessary in playing.

As commonly constructed, the melodeon has two sets of reeds, the one being tuned either a second above or in unison with the other, and both being sounded by the opening of one valve. To this, two other sets have been added by introducing another reed-board of precisely similar construction, having its rank of keys situated above and in the rear of the keys of the first sets. These are tuned to some other interval, or in unision, as desired, and all may be sounded by the lower key-board by merely coupling the upper one to it, as is well known. The touch, however, of the keys used, it is obvious, must be now doubled in its heaviness and stiffness.

According to this improvement the reed-board of ordinary construction is divided along its central line, and the two parts removed a short distance apart, say one inch, as shown at *a a*. Upon these is placed another ordinary reed-board, *b*, but having no pallets or valves of its own, and in which the reeds are placed at the same distances apart as are those in the first board, whereby each pair of reeds of the upper board will be in the same vertical plane with a pair of the lower board. The divisions between the reeds of the board, *b*, must now be continued down through the intermediate space, *c*, to the lower surface of a board, *a*, as indicated at *d*, and in each of these spaces a block, *e*, is put, having a hole bored through to serve as a guide for the valve-rod, *f*. One valve, *g*, of usual construction, will now cover the slot in the lower reed-board, and this slot is just so much longer as the two parts, *a a*, have been removed asunder. Two other sets of reeds may be added by removing the parts, *a a*, still further, and dividing the board, *b*, as before described for *a*, when another reed-board may be placed upon that. The valve, *g*, is represented as opened, and the arrows show the direction of the currents of air in an instrument operated by an exhausting bellows. The valves, it will be seen, are not increased in number by any increase in the number of reeds, but are only slightly lengthened, and in an exhausting instrument the heaviness of touch is but very slightly increased for each additional set of reeds. Any one set of these may be shut off by stops, as usual, so that the quantity of tone may be reduced at will.

This appears to be a very excellent improvement. Other information relating to patent rights, &c., may be obtained by letter addressed to the patentee at Wolcotville, Litchfield Co., Conn.

Iodo-Nitrate of Silver.

This substance, the active principle in the collodion photographic process, has been found to be a definite compound of the iodide and the nitrate of silver, its composition being represented by AgO, NO5+AgI. It is blackened on exposure to light much more rapidly than either of its ingredients alone. It is unaffected by, and insoluble in absolute alcohol, but is decomposed by water. Its proper solvent is a concentrated solution of nitrate of silver. It may be obtained in regular crystals. Photographic silver baths which have been for some time in use, always contain a portion of this compound, the reason of their superiority to those more recently prepared.

Chloride and bromide of silver do not yield similar double salts, which explains why negative photographs on bromide of silver alone are deficient in intensity.

NITRATE OF SILVER STAINS—These stains may be removed by a solution of 8 parts perchloride of mercury, and 4 parts sal-ammoniac in 125 parts water, or one of 5 grms. cyanide of potassium, and 50 centigrms. iodine in 45 grms. water.—[London Artizan.

Japan Cotton.

Samples of Japan cotton recently received in this city, have a fine color, and the fiber has a greater number of barbs, so that it will draw with proper handling, into a very fine thread. It has apparently a great many natural crooks in each fiber (this appearance may be given to it in dressing,) which renders it easier to spin, and makes a bat of it very elastic. From this cause, and a natural harshness, owing to the number of barbs in the fiber, it feels to the touch very much like wool.

Pennsylvania now produces as much iron as was manufactured in Great Britain thirty years ago, and of a quality that compares very favorably.—[Exchange.

Literary Notices.

THE EDINBURGH REVIEW—The number for the present quarter of this able review published by Leonard Scott & Co., No. 54 Gold st., this city, contains eleven powerful articles on various subjects. The first is a review of the memoirs of King Joseph Bonaparte, and contains many incidents favorable to Joseph, and the reverse to his brother, Napoleon the Great. One article on the early Pilgrim Fathers of New England, is very unfavorable to their reputation as lovers of freedom. Essays to prove that the planets are inhabited, and vice versa, are not yet exhausted; one of the articles is a review of the recent pre-eminent works on this subject. It displays an intimate acquaintance with astronomy. Although this review is the oldest in Great Britain, this number shows that it is edited with the same vigor as when Jeffrey sat in the editorial chair.

VILLAGE AND FARM COTTAGES—Messrs. Cleaveland and Backus Brothers, three of the most talented architects of which New York City can boast, are the authors of a new work entitled as above. It contains a large number of splendid engravings representing a great variety of exterior designs and internal plans for dwelling houses, with statements of their estimated cost. The buildings represented are chiefly those that are wanted by farmers, and residents in the country. Many of the designs, although beautiful in appearance, may nevertheless be realized for very moderate sums. Indeed, it has been one of the principal objects of the authors to acquaint the public with the fact, that it is just about as cheap to build a handsome looking, convenient dwelling, as a mean and awkward one. In this volume there are designs for houses costing from $500 to $600, which, for comfort and beauty are fit for princes to live in. The more costly designs are still more elegant. We believe that all who propose to build, whether their dwellings are intended to be small or great, will have their architectural ideas improved, and some of their money saved, by consulting the pages of this book. A portion of the work is devoted to information respecting the laying out of grounds, gardens, and the culture of fruit. New York, published by D. Apton & Co.

TEN YEARS AMONG THE MAIL BAGS—This is a handsomely illustrated volume by Mr. J. Holbrook, a special agent of the U. S. Post Office Department. He narrates some of the most thrilling and remarkable circumstances connected with the discovery and detection of crime in the matter of mail robberies that we have ever read. Much light is also thrown upon the interior workings of the American postal system. The author's travels upon official business were very extensive, carrying him to all parts of the country, among all sorts of people. His descriptions of scenes and characters are vivid and life-like. Philadelphia, H. Cowperthwait; New York, J. C. Derby.

THE KANSAS REGION—by Max Greene.—The Author is an amateur traveler, fond of roaming and adventure. His volume is an easy, off-hand, interesting description of Kansas, through which country he has repeatedly passed. The book also contains directions to emigrants as to the best routes, localities for settlers, outfits required, usages of society, &c. Those who are looking Westward for homes, or who desire to inform themselves respecting matters and things in general out there, will do well to consult this new work. Fowler & Wells, publishers, 308 Broadway, N. Y.

NEW YORK HORTICULTURAL REVIEW—This is the title of a new monthly periodical, which has just appeared as a candidate for the patronage of all those interested in horticulture. It is edited by C. Reagles, No. 208, Broadway, this city, and judging from this specimen number, he appears to be eminently qualified for his profession. The engravings in it are neat, and the subjects well chosen and skillfully treated.

"Mysteries of the Court of the Stuarts," by Wm. H. Ainsworth; T. B. Peterson, publisher, No. 102 Chestnut st., Philadelphia, Pa. Price 50 cents. Just issued.

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